C 21.5: 968/4

Vol. 968 Number 4

OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

March 28, 1978

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OFFICIAL GAZETTE of the UNITED STATES PATENT and TRADEMARK OFFICE

March 28, 1978 Volume 968 Number 4

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PATENT AND TRADEMARK OFFICE NOTICES

Board of Appeals Decisions Rendered in the Month of February 1978

Affirmed	189
Affirmed in part	21
Reversed	72
Total	282

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,647,816, Re. S.N. 872,940, Filed Jan. 27, 1978, Cl. 260/309, N-SUBSTITUTED IMIDAZOLES AND THEIR SALTS, Wilfried Draber, et al., Owner of Record: *Bayer Aktiengesellschaft, Leverkusen, Germany,* Attorney or Agent: None, Ex. Gp.: 121

3,801,623, Re. S.N. 872,330, Filed Jan. 25, 1978, Cl. 260/468 D, CYCLOPENTANONE DERIVATIVES, Jacques Martel, et al., Owner of Record: *Roussel-UCLAF, Paris, France,* Attorney or Agent: Nelson Littell, et al., Ex. Gp.: 126

3,917,241, Re. S.N. 846,784, Filed Oct. 31, 1977, Cl. 266/91, MOLTEN METAL HOLDING FURNACE SYSTEM, Theodore J. Steffora, et al., Owner of Record: *Lectromelt Corporation, Pittsburgh, Pa.,* Attorney or Agent: Fred Wiviott, et al., Ex. Gp.: 325

3,930,248, Re. S.N. 863,856, Filed Dec. 23, 1977, Cl. 340/267 R, IMPACT SENSING DETECTOR, Michael I. Keller, Owner of Record: *Inventor,* Attorney or Agent: Howard L. Bernstein, Ex. Gp.: 234

3,942,624, Re. S.N. 871,980, Filed Jan. 24, 1978, Cl. 198/502, CANTILEVERED BELTED BAG LOADING APPARATUS AND METHOD, Vytautas Kupcikevicius, Owner of Record: *Union Carbide Corp., New York, N.Y.,* Attorney or Agent: Maurice W. Ryan, et al., Ex. Gp.: 313

3,960,225, Re. S.N. 864,931, Filed Dec. 27, 1977, Cl. 177/121, CONVEYOR BELT SYSTEM WITH POSITIONAL TRANSFORMATION OF WEIGHT DATA, Frank S. Hyer, et al., Owner of Record: *Hyder Industries, Inc., Pembroke, Mass.,* Attorney or Agent: Melvin R. Jenney, et al., Ex. Gp.: 211

3,977,101, Re. S.N. 872,701, Filed Jan. 26, 1978, Cl. 37/8, CONVEYOR CONTROL SYSTEM FOR A SELF-LOADING SCRAPER, Edward J. Ohms, Owner of Record: *Caterpillar Tractor Co., Peoria, Ill.,* Attorney or Agent: Bradford Wiles, et al., Ex. Gp.: 337

3,977,102, Re. S.N. 872,700, Filed Jan. 26, 1978, Cl. 37/8, LOAD EJECTION IMPROVEMENT FOR SELF-LOADING SCRAPERS, Edward J. Ohms, Owner of Record: *Caterpillar Tractor Co., Peoria, Ill.,* Attorney or Agent: Bradford Wiles, et al., Ex. Gp.: 337

4,049,648, Re. S.N. 869,900, Filed Jan. 16, 1978, Cl. 542/426, PG-TYPE, 1,9-LACTONES, Gordon L. Bundy, Owner of Record: *The Upjohn Company, Kalamazoo, Mich.,* Attorney or Agent: Robert A. Armitage, et al., Ex. Gp.: 117

PATENT NOTICES

Certificates of Correction for the Week of Mar. 28, 1978

P.P. 4,124	4,041,509	4,054,120	4,060,584
D. 246,324	4,041,686	4,054,154	4,060,621
D. 247,457	4,041,749	4,054,331	4,060,637
3,659,937	4,041,886	4,054,380	4,060,647
3,686,758	4,041,895	4,054,537	4,060,708
3,690,846	4,042,343	4,054,538	4,060,868
3,767,695	4,042,636	4,054,681	4,060,878
3,785,983	4,042,912	4,054,711	4,060,884
3,876,634	4,043,338	4,054,783	4,061,053
3,894,084	4,043,501	4,054,909	4,061,187
3,911,405	4,043,875	4,054,947	4,061,262
3,954,851	4,043,934	4,055,158	4,061,273
4,007,445	4,044,024	4,055,259	4,061,302
4,017,137	4,044,167	4,055,304	4,061,481
4,017,346	4,044,554	4,055,477	4,061,562
4,022,769	4,045,385	4,055,791	4,061,747
4,025,369	4,045,403	4,056,158	4,061,907
4,026,199	4,045,762	4,056,169	4,062,032
4,027,028	4,046,609	4,056,594	4,062,238
4,029,799	4,046,882	4,056,602	4,062,517
4,031,582	4,048,120	4,056,656	4,062,533
4,032,944	4,049,491	4,056,835	4,062,678
4,033,103	4,049,519	4,056,877	4,062,778
4,034,116	4,049,712	4,057,048	4,062,845
4,034,765	4,050,357	4,057,198	4,062,965
4,035,005	4,050,591	4,057,565	4,062,987
4,035,375	4,050,607	4,057,599	4,063,227
4,036,602	4,050,834	4,057,762	4,063,277
4,036,776	4,050,878	4,058,562	4,063,367
4,036,996	4,050,959	4,058,602	4,063,465
4,037,655	4,051,089	4,058,669	4,063,470
4,038,302	4,051,505	4,058,766	4,064,200
4,039,123	4,051,970	4,058,839	4,064,231
4,039,130	4,052,504	4,058,953	4,064,388
4,039,587	4,052,641	4,058,961	4,064,587
4,039,815	4,052,893	4,059,144	4,065,057
4,039,840	4,052,966	4,060,000	4,065,135
4,039,844	4,052,967	4,060,113	4,065,427
4,040,842	4,053,350	4,060,114	4,065,581
4,040,926	4,053,381	4,060,290	4,065,833
4,040,957	4,053,510	4,060,294	4,066,168
4,040,988	4,053,547	4,060,539	4,066,277
4,041,041	4,053,601	4,060,548	4,067,055
4,041,152	4,054,073	4,060,566	

Disclaimers

3,642,130.—*Paul J. Altenpohl*, Bryn Mawr, Pa. MODULAR WEIGHT SORTING ASSEMBLY FOR CONVEYORS. Patent dated Feb. 15, 1972. Disclaimer filed Feb. 3, 1978, by the assignee, *W. F. Altenpohl, Inc.*

Hereby enters this disclaimer to claims 1–3, 5–8, 14 and 24 of said patent.

3,736,854.—*David E. Beach*, Rochester, N.Y. FILM METERING MECHANISM FOR CAMERAS. Patent dated June 5, 1973. Disclaimer filed Jan. 31, 1978, by the assignee, *Eastman Kodak Company.*

Hereby enters this disclaimer to claims 1 through 11 of said patent.

3,875,361.—*Yukio Fukui* and *Mitsuru Watanabe*, Yokohama, Japan. MICROWAVE HEATING APPARATUS HAVING AUTOMATIC HEATING PERIOD CONTROL. Patent dated Apr. 1, 1975. Disclaimer filed Jan. 11, 1978, by the inventors, the assignee, *Hitachi, Ltd.*, assenting.

Hereby enter this disclaimer to claim 1 of said patent.

4,007,470.—*Edwin H. Land*, Cambridge, Mass. BATTERY OPERATED CAMERA HAVING A HANDLE THEREON FORMED IN PART BY AN EXTERNAL BATTERY. Patent dated Feb. 8, 1977. Disclaimer filed Dec. 12, 1977, by the assignee, *Polaroid Corporation.*

Hereby enters this disclaimer to claims 13 and 14 of said patent.

Disclaimer and Dedication

4,029,910.—*Roy E. Allison*, Wayland, Mass. WIDE DISPERSION LOUDSPEAKER WITH FLEXING DIAPHRAGM. Patent dated June 14, 1977. Disclaimer and dedication filed Jan. 16, 1978, by the assignee, *Allison Acoustics Inc.*

Hereby disclaims and dedicates to the Public all claims of said patent.

Dedication

3,888,585.—*Thomas R. Cross*, Rochester, N.Y. SEMI-AUTOMATIC DOCUMENT HANDLER. Patent dated June 10, 1975. Dedication filed Feb. 6, 1978, by the assignee, *Xerox Corporation.*

Hereby dedicates to the Public the entire remaining term of said patent.

National Technical Information Service

GOVERNMENT-OWNED INVENTIONS

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The inventions listed below are owned by the U.S. Government and are available for domestic and possibly foreign licensing in accordance with the licensing policies of the agency-sponsors.

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Copies of the patent applications can be purchased from the National Technical Information Service (NTIS), Springfield, Va. 22161 for $4.00 ($8.00 outside North American Continent). Requests for copies of patent applications must include the patent application number. Claims are deleted from patent application copies sold to the public to avoid premature disclosure in the event of an interference before the Patent and Trademark Office. Claims and other technical data will usually be made available to serious prospective licensees by the agency which filed the case.

Requests for licensing information on a particular invention should be directed to the address cited for the agency-sponsor.

DOUGLAS J. CAMPION,
Patent Program Coordinator,
National Technical Information Service.

U.S. DEPT. OF AGRICULTURE
Research Agreements & Patent Branch General Services Division/Federal Bldg., Agricultural Research Service Hyattsville, Md. 20782

Patent application 835,104. Dust Control During Grain Processing Operations. Filed Sept. 21, 1977.

Patent application 837,489. Soil Stabilization Method. Filed Sept. 28, 1977.

Patent application 837,931. Biodegradable Starch-Based Films. Filed Sept. 28, 1977.

Patent application 840,423. Production of Homodeoxyharringtonine and Other Cephalotaxine Esters by Tissue Culture. Filed Oct. 7, 1977.

U.S. DEPT. OF COMMERCE
National Technical Information Service
5285 Port Royal Road, Springfield, Va. 22161

Patent application 860,799. Method and Apparatus for Implementation of the CMAC Mapping Algorithm. Filed Dec. 15, 1977.

U.S. DEPT. OF TRANSPORTATION
Patent Counsel, 400 7th St., SW., Washington, D.C. 20590

Patent 4,058,911. Road-Runner Alcohol Safety Interlock System. Filed Aug. 18, 1976. Patented Nov. 22, 1977. Not available NTIS.

U.S. DEPT. OF HEALTH EDUCATION & WELFARE
National Institutes of Health, Chief, Patent Branch Westwood Building, Bethesda, Md. 20014

Patent application 802,189. N-Formyl Peptides Useful as Leucoattractants. Filed May 31, 1977.

U.S. DEPT. OF THE INTERIOR

Branch of Patents, 18th and C Sts., SW.,
Washington, D.C. 20240

Patent application 774,354. Sensing Mechanism for Mine Roof Bolting Apparatus. Filed Mar. 4, 1977.

Patent application 809,881. Well Perforating Method for Solution Well Mining. Filed June 24, 1977.

Patent application 817,886. Method for Preparing Solar Collectors. Filed July 21, 1977.

Patent application 817,887. Auger Construction Providing Reduced Noise. Filed July 21, 1977.

Patent application 818,045. Production of Pure Alumina. Filed July 22, 1977.

Patent application 818,183. Method for Eliminating Solution-Level Attack on Cathodes During Electrolysis. Filed July 22, 1977.

Patent application 819,518. Bioelectric Neutralization of Acid Waters. Filed July 26, 1977.

Patent application 829,129. Method of Leaching Aluminum From Feldspar Minerals. Filed Aug. 30, 1977.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF FEBRUARY 11, 1978

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	7-11-77
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	6-1-77
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	7-20-77
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	1-6-77
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	3-7-77
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	12-10-76
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	8-9-76
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	2-28-77
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	7-5-77
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	9-3-76
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	5-6-76
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	1-28-77
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus: Plastics Working Apparatus; Plastic Block and Earthenware Apparatus: Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	5-17-77
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	1-6-77
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	2-9-77
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors: Miscellaneous Hardware; Locks; Building Structures: Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	5-9-77

Expiration of patents: The patents within the range of numbers indicated below expire during February 1978, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,970,313 to 2,973,518, inclusive
Plant Patents..... Numbers 2,019 to 2,031, inclusive

REISSUES

MARCH 28, 1978

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

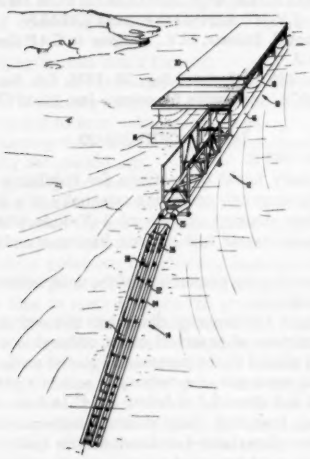
Re. 29,591
COLUMN STABILIZED STINGER TRANSITION SEGMENT AND PIPELINE SUPPORTING APPARATUS

Samuel H. Lloyd, Houston, Tex., assignor to Santa Fe International Corporation, Orange, Calif.

Original No. 3,704,596, dated Dec. 5, 1972, Ser. No. 22,634, Mar. 25, 1970. Continuation of Ser. No. 529,558, Dec. 4, 1974, abandoned. Application for reissue May 17, 1976, Ser. No. 687,172

Int. Cl.² B63B *35/04;* F16L *1/00*

U.S. Cl. 61—108 **46 Claims**



1. A transition segment for laying pipeline on an underwater surface from a floating vessel having a pipeline work deck elevated above the mean waterline comprising:

an elongated base structure;

a plurality of elements upstanding from said base structure with at least a number of said elements comprised of buoyant stabilizing columns located on opposite sides of the pitch and roll axes of the segment;

buoyancy control means for submerging said base structure and portions of said upstanding elements below the waterline to obtain a high draft floating condition, the displacement of the submerged base structure and portions of said upstanding elements being sufficient to maintain the segment buoyant in a pipeline portion supporting condition with the mean waterline located intermediate the height of said columns;

means carried by said segment adjacent its forward end for pivotally coupling the latter to the pipelaying vessel;

and means carried by said segment for supporting a portion of a pipeline for translational movement therealong, said pipeline support means being located above said base structure at elevations of decreasing height relative to said base structure in a forward to aft direction along said segment, the pipeline support means being adapted to receive pipeline payed out from the elevated work deck of the pipelaying vessel.

Re. 29,592
BLOW MOLDING PROCESS FOR MANUFACTURING GRINDING WHEELS

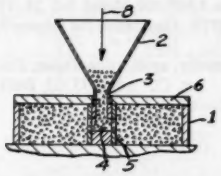
Daniel Robert Vinard, Enghien-les-Bains, France, assignor to Norton Company, Worcester, Mass.

Original No. 3,963,459, dated Jun. 15, 1976, Ser. No. 403,081, Oct. 3, 1973. Application for reissue Sep. 10, 1976, Ser. No. 722,289

Claims priority, application France, Oct. 4, 1972, 72.35126

Int. Cl.² C09K *3/14;* C04B *31/16*

U.S. Cl. 51—298 R **3 Claims**



1. A method for manufacturing grinding wheels characterized in that a granulated mixture containing at least abrasive grains and bond [grains] within a hopper is introduced into a cavity of a closed mold by blowing with a compressed gas, said mixture having a relatively uniform distribution of grain sizes proportioned within a formula where D is the mean diameter of the grains in the mixture, at least 90% of the grains have a diameter between 0.5 D and 2D, 2% at most have a diameter less than 0.1 D and the remainder a diameter falling in a range between 0.1 D and 0.5 D whereby a homogeneous mass is obtained when said mixture is poured into the hopper and is blown into the cavity of the mold, then compressing and reducing the volume of said mixture in the cavity of the mold to form a grinding wheel of the desired size, and heating the grinding wheel sufficiently to cure the bond.

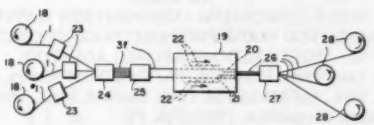
Re. 29,593
PRODUCTION OF MULTIPLE ELONGATED PRODUCTS SUCH AS WIRE

Francis Joseph Fuchs, Jr., Princeton Junction, N.J., assignor to Western Electric Co., Inc., New York, N.Y.

Original No. 3,964,283, dated Jun. 22, 1976, Ser. No. 523,401, Nov. 13, 1974. Application for reissue Mar. 24, 1977, Ser. No. 781,024

Int. Cl.² B21B *45/02*

U.S. Cl. 72—42 **56 Claims**



58. A method of simultaneously producing a plurality of elongated products from a plurality of elongated billets, comprising the steps of:

a. coating each of the elongated billets individually with die lubricating material;

b. assembling the coated elongated billets in the form of a bundle with effective surface engagement between adjacent coated elongated billets included in the bundle;

c. aligning each of the coated elongated billets in the bundle

with a different one of a plurality of apertures extending through a die; and

d. applying a frictional drag force along the outer periphery of the bundle of billets in the direction of an entrance end of the die such that the effective surface engagement between adjacent coated elongated billets included in the bundle will cause each of the billets to advance toward its respective aligned die aperture as a part of the bundle and then to pass through said respective aligned die aperture, whereby a plurality of elongated products will be produced simultaneously.

Re. 29,594

AUTOMATIC LOCKING ACCELERATION ACTUATED VEHICLE SAFETY BELT RETRACTOR

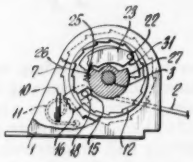
Takezo Takada, deceased, late of Hikone, Japan, by Juichiro Takada, heir, Tokyo, Japan, assignors to Takata Kojyo Co., Ltd., Tokyo, Japan

Original No. 3,897,024, dated Jul. 29, 1975, Ser. No. 441,534, Feb. 11, 1974. Application for reissue Aug. 17, 1976, Ser. No. 715,029

Claims priority, application Japan, Feb. 12, 1973, 48-16530

Int. Cl.[2] A62B *35/02*; B65H *75/48*

U.S. Cl. 242—107.4 B **18 Claims**



9. An automatic locking safety belt retractor comprising a rotatable take-up reel spring biased in a belt rewind direction, a safety belt connected to and retractable by and withdrawable from said reel, a first ratchet wheel rotatable with said reel, a first pawl mounted for movement between positions engaging and disengaging said first ratchet wheel, a second ratchet wheel coaxial with and rotatable relative to said first ratchet wheel, a second pawl rotatable with said first ratchet wheel and movable between positions engaging and disengaging said second ratchet wheel and normally urged to said ratchet wheel disengage position, actuating means for urging said second pawl into engagement with said second ratchet wheel, and means drive coupling said second ratchet wheel and said first pawl whereby rocking of said second ratchet wheel advances said first pawl into engagement with said first ratchet wheel to lock said reel against belt withdrawal rotation, said retractor being characterized by said first and second ratchet wheels having equal numbers of ratchet teeth.

Re. 29,595

WELL CEMENTING COMPOSITION HAVING IMPROVED FLOW PROPERTIES CONTAINING A POLYAMIDO-SULFONIC ADDITIVE

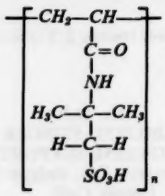
Sally Lee Adams, Pittsburgh, Pa.; Fred David Martin, Socorro, N. Mex., and Michael M. Cook, Boxford, Mass., assignors to Calgon Corporation, Pittsburgh, Pa.

Original No. 3,936,408, dated Feb. 3, 1976, Ser. No. 465,936, May 1, 1974. Application for reissue Apr. 20, 1977, Ser. No. 789,151

Int. Cl.[2] C08K *3/00*

U.S. Cl. 260—29.6 S **7 Claims**

10. A cementing composition comprising hydraulic cement in admixture with from about 0.01 to about 5.0 percent by weight, based on the weight of hydraulic cement, of a polyamido-sulfonic compound comprising recurring units represented by the formula:



wherein n is an integer of from 2 to about 100, such that the weight average molecular weight of the polyamido-sulfonic compound is from about 200 to about 10,000.

Re. 29,596

BRANCHED CHAIN DODECYL ISOMERIC MIXTURES OF 2-(5-DODECYL-2-HYDROXY PHENYL) BENZOTRIAZOLE AS STABILIZERS FOR HEAT AND LIGHT SENSITIVE MATERIALS

Albert F. Strobel, Delmar, N.Y., assignor to GAF Corporation, Wayne, N.J.

Original No. 3,983,132, dated Sep. 28, 1976, Ser. No. 500,083, Aug. 23, 1974. Application for reissue Jan. 21, 1977, Ser. No. 761,492

Int. Cl.[2] C07D *249/20*

U.S. Cl. 260—308 B **13 Claims**

1. A normally liquid composition for stabilizing heat and light sensitive materials consisting essentially of a mixture of branched-chain dodecyl isomers of 2-(5'-dodecyl-2'-hydroxyphenyl) benzotriazole said mixture having a melting point below 0° C.

7. A process for the preparation of the composition of claim 1 which comprises:

a. Coupling a 2-nitrophenyl diazonium salt with a normally liquid mixture of branched chain dodecyl isomers of 4-dodecyl phenol in the presence of glacial acetic acid and an alkali metal salt of a carboxylic acid at a pH between about 3 and about 5.5 at below 15° C to form the corresponding branched chain dodecyl isomeric mixture of 2-(2'-nitro-phenylazo)-4-dodecylphenols; and

b. Cyclizing said branched chain isomeric mixture of said 2-(2'-nitrophenylazo)-4-dodecylphenols to the corresponding branched chain dodecyl isomeric mixture of triazoles in a solution with a zinc catalyst in the presence of [a mineral acid to form] *an alkali metal hydroxide to form* the corresponding normally liquid mixture of claim 1 as the product of the process.

Re. 29,597

PROCESS FOR THE PRODUCTION OF EPOXIDES

Arthur M. Brownstein, Wyckoff; John A. Jung, Somerset, and Robert Hansen, Belleville, all of N.J., assignors to Chem Systems Inc., New York, N.Y.

Original No. 4,012,423, dated Mar. 15, 1977, Ser. No. 597,037, Jul. 18, 1975. Continuation of Ser. No. 444,836, Feb. 22, 1974, abandoned, which is a continuation-in-part of Ser. No. 348,970, Apr. 9, 1973, abandoned. Application for reissue Apr. 14, 1977, Ser. No. 787,365

Int. Cl.[2] C07D *301/02*

U.S. Cl. 260—348.16 **16 Claims**

1. In a process for the preparation of oxirane compounds which comprises the deacyloxylation of vicinal hydroxyesters [derived from oxygen,] *of* an olefin, [and a carboxylic acid,] wherein the olefin is ethylene, propylene, a butylene, a pentene, styrene, or alphamethylstyrene, and the [carboxylic acid is] *ester is of* acetic, propionic, or butyric *acid*, the improvement which comprises performing said deacyloxylation reaction in the vapor phase at a temperature of from 250° to 600° C in the presence of a basic material having a pH of from 8 to 13 in a 0.1 molar aqueous solution.

Re. 29,598

METHOD FOR RECOVERING VANADIUM-VALUES FROM VANADIUM-BEARING IRON ORES AND IRON ORE CONCENTRATES

Conrad B. Bare, Coopersburg, and Joseph W. Pasquali, Bethlehem, both of Pa., assignors to Bethlehem Steel Corporation, Bethlehem, Pa.

Original No. 3,853,982, dated Dec. 10, 1974, Ser. No. 413,723, Nov. 7, 1973. Application for reissue Mar. 31, 1977, Ser. No. 783,352

Int. Cl.[2] C01G *31/00*

U.S. Cl. 423—68 **32 Claims**

1. An improved method for extracting vanadium-values from vanadium-bearing iron ores wherein said ores are comminuted to a relatively fine particle size and are roasted and leached to produce a vanadate-rich aqueous solution and an undissolved residue containing iron-values, without contaminating said undissolved residues with alkali, said method comprising:

a. mixing said comminuted vanadium-bearing iron ores and at least one calcium containing material taken from the group consisting of limestone, lime, hydrated lime and dolomite,

b. charging the mix into a furnace,

c. roasting the mix at a temperature for a time in an atmosphere containing oxygen to oxidize the vanadium-values therein and to form calcium vanadates,

d. discharging the roasted mix from the furnace,

e. cooling the roasted mix,

f. comminuting the roasted mix,

g. leaching the comminuted roasted mix in an aqueous solution of at least one material taken from the group consisting of sodium carbonate, sodium bicarbonate, potassium carbonate, potassium bicarbonate, ammonium carbonate, ammonium bicarbonate and water sparged with CO_2 gas for a time to react a substantial portion of the calcium vanadates with the leaching agent to form vanadates which are readily soluble in the aqueous solution to form a vanadate-rich aqueous solution and at least one calcium compound taken from the group consisting of calcium carbonate and calcium bicarbonate which is substantially insoluble in the aqueous solution and which remains in the undissolved residue containing iron-values, and

h. separating the vanadate-rich aqueous solution from the undissolved residue containing iron-values.

Re. 29,599

CONTROL CIRCUIT FOR PHOTOGRAPHIC APPARATUS

Francis T. Ogawa, Lakewood, Colo., assignor to Honeywell Inc., Minneapolis, Minn.

Original No. 3,917,395, dated Nov. 4, 1975, Ser. No. 374,691, Jun. 28, 1973. Application for reissue Jun. 21, 1976, Ser. No. 698,384

Int. Cl.[2] G03B *7/08, 3/00, 15/05*

U.S. Cl. 354—23 D **6 Claims**

1. In an automatic photographic camera featuring a plurality of automatic functions, a control system for controlling the sequence and actuation of said automatic functions, said control system comprising:

means for producing a plurality of parametric signals representative of parameters related to said automatic functions,

a binary logic control circuit responsive to said parametric signals for producing a plurality of control signals,

said binary logic control circuit including means for establishing the selection and sequence of the actuation of said automatic functions,

means responsive to said control signals to effect the actuation of said automatic functions,

said control system including an automatic exposure control means for controlling the operation of the shutter of said camera,

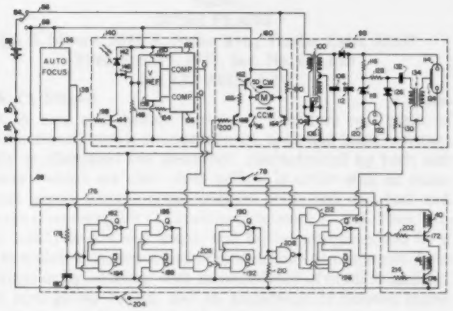
said control means including an integrating light sensing means,

voltage reference means,

signal comparator means connected to said light sensing means and to said voltage reference means for producing one of said parametric signals as a function of the comparison of the outputs of said voltage reference means and said light sensing means,

said binary logic control circuit including gating means responsive to said one parametric signal for controlling the operation of the shutter of said camera,

said automatic functions including an automatically controlled electronic flash means, said automatic exposure



control means including means for sampling the ambient light at a point in time early in the opening phase of the shutter of said camera,

means for producing a further parametric signal representative of the result of the sampling of said ambient light, and

said binary logic control circuit includes means responsive to said further parametric signal to control the actuation of said electronic flash means, in accordance with the value of its ambient light whereby said electronic flash means is actuated to produce a flash whenever said ambient light is below a predetermined value and to block the actuation of said electronic flash means whenever the ambient light is above said predetermined value.

Re. 29,600

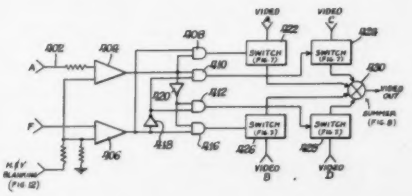
ROTARY SPECIAL EFFECTS GENERATOR

Nikola B. Tkacenko, Sunnyvale, Calif., assignor to Sarkes Tarzian, Inc., Bloomington, Ind.

Original No. 3,812,286, dated May 21, 1974, Ser. No. 131,300, Apr. 5, 1971. Application for reissue May 19, 1976, Ser. No. 687,917

Int. Cl.[2] H04N *5/77*

U.S. Cl. 358—183 **24 Claims**



1. An apparatus for combining first and second incoming video signals so as to produce a composite video signal that produces a composite image containing portions of the incoming signals separated by straight-line boundaries which boundaries may be rotated, said apparatus comprising:

a source of one or more horizontal sawtooth waveforms;

a source of one or more vertical sawtooth waveforms;

signal mixing means coupled to said sources and having an output at which is presented a mixture of one horizontal sawtooth waveform with one vertical sawtooth waveform, said mixing means including externally operable control means for setting the proportions of the mixture and for determining which waveforms are included in the mixture;

comparator means having an input connected to the output of said mixing means for generating a binary output signal indicating whether the comparator means input signal is above or below a reference level; and

video switching means into which the first and second incoming video signals are fed and out of which the composite video signal flows for switching between the incoming signals under the control of the output signals generated by the comparator means in such a manner that the first video signal becomes the composite video signal when the binary output signal is in one state and the second video signal becomes the composite output signal when the binary output signal is in the other state.

PLANT PATENTS

GRANTED MARCH 28, 1978

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,228

CHRYSANTHEMUM PLANT

Walter H. Jessel, Jr., Grantsville, W. Va., and William E. Duffett, Salinas, Calif., assignors to Yoder Brothers, Inc., Barberton, Ohio

Filed Mar. 28, 1977, Ser. No. 781,863
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—74 **1 Claim**

1. A new and distinct cultivar of *Chrysanthemum morifolium,* Ramat, known by the cultivar name Camino Gold and particularly characterized as to uniqueness by the combined characteristics of flat capitulum form, daisy capitulum type, dark yellow ray floret color with minimal color oxidation, uniform 9 week flowering response to photoperiodic shortday control, medium plant height, diameter across face of capitulum from 55 to 80 mm. at maturity, and semi-upright branching pattern.

4,229

CHRYSANTHEMUM PLANT

Walter H. Jessel, Jr., Grantsville, W. Va., and William E. Duffett, Salinas, Calif., assignors to Yoder Brothers, Inc., Barberton, Ohio

Filed Mar. 28, 1977, Ser. No. 781,864
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—74 **1 Claim**

1. A new and distinct cultivar of *Chrysanthemum morifolium,* Ramat, known by the cultivar name Camino Bronze and particularly characterized as to uniqueness by the combined characteristics of flat capitulum form, daisy capitulum type, orange-bronze ray floret color with minimal color oxidation, uniform 9 week flowering response to photoperiodic shortday control, medium plant height, diameter across face of capitulum from 60 to 80 mm. at maturity, and semi-upright branching pattern.

4,230

ROSE PLANT

Ralph S. Moore, 2519 E. Noble Ave., Visalia, Calif. 93277

Filed Jun. 10, 1977, Ser. No. 805,610
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—3 **1 Claim**

1. A new and distinct variety of miniature rose plant of hardy, dwarf, bushy, rounded, much branched habit, substantially as illustrated and described, characterized by buds and flowers which are clear deep yellow in color with an occasional guard (outer) petal splashed with red, the bud and flower resembling Bit O'Sunshine (miniature — U.S. Plant Pat. No. 1,631) in size and shape; and further characterized by a plant which is vigorous and compact, easy to propagate from cuttings or by budding, with an abundance of small to medium size semi-glossy foliage and an abundance of flowers borne singly or several to the stem in loose clusters.

4,231

ROSE PLANT

Ralph S. Moore, 2519 E. Noble Ave., Visalia, Calif. 93277

Filed Jun. 10, 1977, Ser. No. 805,609
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—3 **1 Claim**

1. A new and distinct variety of miniature rose plant of hardy, dwarf, bushy, upright, much branched habit substantially as illustrated and described, characterized by buds and flowers which are generally of a clear yellow color, the center of opening buds and flowers at times tending to be deeper yellow (or gold yellow); with buds and flowers being similar in size and shape to Bit O'Sunshine (U.S. Plant Pat. No. 1,631, expired) but having more petals; and further characterized by a plant similar to Yellow Magic (miniature, not patented) which is vigorous and compact, the shoots and branches having fairly short internodes, said plant being easy to propagate from cuttings; and having an abundance of semi-glossy to matt foliage, with flowers borne singly or several to the stem in loose clusters.

PATENTS

GRANTED MARCH 28, 1978

ERRATA

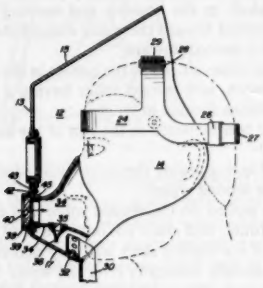
For CLASS	See PATENT NO.
137–107	4,080,998
116–055	4,081,027
197–113	4,081,070
235–092 PB	4,081,130
128–402	4,081,150
062–532	4,081,257
424–304	4,081,454
560–055	4,081,475
560–255	4,081,476
426–235	4,081,509
200–083 Q	4,081,621
235–308	4,081,662
364–467	4,081,663
364–705	4,081,664
362–223	4,081,665
362–253	4,081,666
362–296	4,081,667
362–296	4,081,668
365–154	4,081,697
365–118	4,081,794

PATENTS

GRANTED MARCH 28, 1978

GENERAL AND MECHANICAL

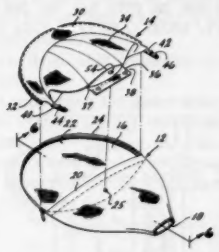
4,080,664
WELDER'S HOOD WITH AIR FILTER
Louis Morris, and Lois Ann Morris, both of 1208 Radbard St., Carson, Calif. 90746
Filed Jan. 9, 1976, Ser. No. 647,936
Int. Cl.[2] A61F 9/06
U.S. Cl. 2—8 **1 Claim**



1. In a protective hood for use by welders of the type including a headgear having a headband encircling the head above the ears and a top band connected to the headband and extending over the top surface of the head, a hood including a face panel and rearwardly extending side, top and bottom panels, means pivoting the free rear edge portions of the side panels to the headband forwardly of the ears to enable the hood to pivot to an inoperative position with the face panel above the top of the head, said face panel including window means therein alignable with the eyes to enable safe observation of the work area, the improvements comprising extensions on the rear edges of the side panels, said extensions extending substantially beyond the pivoting means and adapted to cover the ears of a welder when the hood is in operative position with the face panel in front of the face of the welder, a depending flexible flap attached to the rear edge of the bottom panel and disposed in front of the neck area of the welder when the hood is in operative position, a hollow, generally tubular face engaging mask disposed interiorly of the hood and including a rear peripheral end edge in sealing contact with the face of the welder in enclosing relation to the nose and mouth of the welder, the forward end edge of said mask being secured to said face panel in peripheral relation to an opening through said face panel, a one-way flutter type exhaust valve in said mask intermediate the end edges thereof to enable a welder to exhale therethrough, said opening in the face panel being defined by a forwardly extending flange having a peripheral inwardly extending abutment at the rear edge thereof, a filter element inserted into said flange and engaged with said abutment to filter inhaled air, and a removable annular cover engaged with said flange and overlying a portion of the peripheral forward surface of the filter element to removably secure the filter element in the opening to enable replacement thereof.

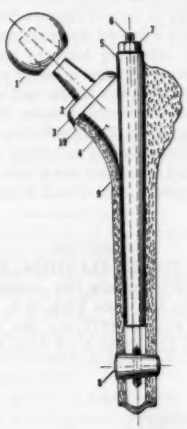
4,080,665
COMBINATION TENNIS RACKET COVER AND CAP OR HAT
Morrie Hodes, Box 35161, Los Angeles, Calif. 90035
Filed Oct. 12, 1976, Ser. No. 731,721
Int. Cl.[2] A42B 1/06
U.S. Cl. 2—209.1 **11 Claims**

1. A combination tennis racket cover and article of headwear comprising a first part and a second part, means for separably attaching the first part and second part together, the parts having a construction and shape such that when attached together they form a tennis racket cover having an opening for the handle of the racket to extend through, one of the parts



being constructed to form an article of headwear and to be usable as such when separated from the other part.

4,080,666
IMPLANTABLE PROSTHETIC BONE DEVICE
Irving E. Fixel, 111 N. 31st Ave., Hollywood, Fla. 33021
Filed Sep. 13, 1976, Ser. No. 722,371
Int. Cl.[2] A61F 1/24
U.S. Cl. 3—1.91 **7 Claims**



1. A prosthetic device for repair or replacement of joints of skeletal bones, by implantation in skeletal bone, said prosthetic device comprising

a hollow columnar support member,

a brace member rigidly attached to said support member at one end thereof,

a collar member rigidly attached to an end of said brace member,

an attachment pin rigidly attached to said collar member and extending outward therefrom,

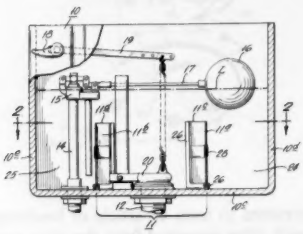
a substantially spherical member having means thereon for connecting said spherical member to said attachment pin,

an anchor member having a first means thereon for engaging a bone to which the prosthetic device is to be implanted and a second means thereon for engaging said support member, and

a rod member extending through said support member having a first fastener means thereon for fastening said rod to said anchor member and a second fastener means thereon

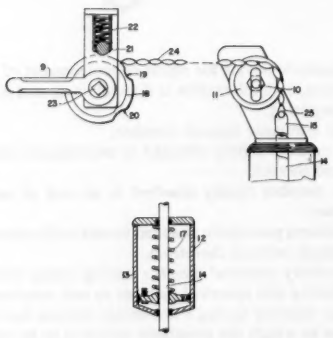
for fastening the end of said support member remote from said anchor member.

4,080,667
WATER SAVING DEVICE
Robert M. Walsh, Moorestown, and John V. Droughton, Keyport, both of N.J., assignors to AQM Corporation
Filed Jun. 20, 1972, Ser. No. 264,546
Int. Cl.[2] E03D *1/20, 1/34, 5/02, 5/10*
U.S. Cl. 4—415 **17 Claims**



1. In combination with a toilet having a water tank with a bottom, a drain located in the bottom, and upstanding walls, the improvement comprising: dike means in said tank for limiting the quantity of water exiting the drain during flushing while maintaining a pressure head adequate to initiate and maintain a siphon action in the toilet, said dike means including a pair of flexible upstanding partition elements having upright side edges engaging opposite tank walls, said partition elements projecting upwardly in bowed relation from said bottom and terminating in edges a spaced distance from said bottom, said partition elements extending between said walls and being spaced from said drain to define a pair of pockets remote from said drain for retaining water below said edges each time the toilet is flushed while permitting water above the drain and pockets to exit the drain for establishing the siphon action, each of said partition elements including a metal member extending between said side edges and a layer of corrosion-resistant material on opposite sides of said metal member.

4,080,668
DUAL TOILET FLUSHING SYSTEM
Charles W. Banes, Winnemucca, Nev., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest
Filed Feb. 16, 1977, Ser. No. 769,280
Int. Cl.[2] E03D *1/22, 5/00, 5/02*
U.S. Cl. 4—325 **1 Claim**



1. A dual toilet flushing system for a water tank having a bottom, a top, a side having a bore formed therethrough in the area of the top, a water dump hole in the bottom of the water tank, a toilet, a water pipe from the water dump hole in the bottom of the water tank to the toilet and a handle member rotatably mounted in the bore through the side of the tank, said dual toilet flushing system comprising

a shaft rotatably mounted in the water tank in the area of the top thereof and extending transversely across the tank and across the water dump hole;

a first roller affixed to the shaft over the water dump hole and rotatable with said shaft;

a hydraulic actuator having a housing in the tank, a control shaft extending through the housing and having spaced opposite first and second ends extending beyond the housing and a coil spring coaxially positioned around the control shaft in the housing and moving the control shaft downward toward the water dump hole after said control shaft is moved upward;

a second roller affixed to the handle in the tank and rotatable therewith, said second roller having a pair of spaced indentations formed in its rim;

a detent ball mounted at the rim of the second roller in the tank;

a detent spring urging the detent ball radially toward the axis of the second roller;

a chain wound on the second roller and extending over the first roller, said chain having a free end affixed to the first end of the control shaft whereby said control shaft hangs substantially vertically over the water dump hole; and

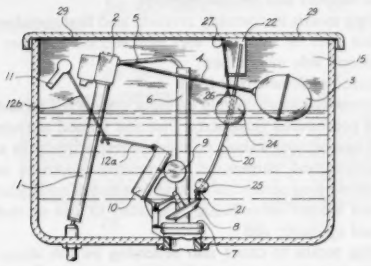
a dump plug affixed to the second end of the control shaft whereby when the handle is turned until the detent ball is moved by the detent spring into a first of the indentations in the rim of the second roller, the control shaft is moved upward a first predetermined amount and moves the dump plug a first predetermined distance above the water dump hole whereby the spring of the hydraulic actuator moves the control shaft downward to close the water dump hole with the dump plug after the lapse of a first period of time thereby providing a first predetermined volume of flushing water through the water pipe during said first period of time, and when said handle is turned until said detent ball is moved by said detent spring into the second of the indentations in the rim of said second roller, said control shaft is moved upward a second predetermined amount and moves said dump plug a second predetermined distance above said water dump hole greater than said first predetermined distance whereby the spring of said hydraulic actuator moves said control shaft downward to close said water dump hole with said dump plug after the lapse of a second period of time longer than said first period of time thereby providing a second predetermined volume of flushing water greater than said first predetermined volume of flushing water through said water pipe during said second period of time.

4,080,669
TWO-LEVEL TOILET FLUSH SYSTEM
William L. Biggerstaff, 1123 Lincoln #6, Santa Monica, Calif. 90403
Filed May 17, 1976, Ser. No. 687,242
Int. Cl.[2] E03D *5/04*
U.S. Cl. 4—325 **5 Claims**

1. In a toilet mechanism having a seat selectably positioned between a lowered position and a raised position and a flush tank, the flush tank including means for filling the tank to a predetermined level, an outlet valve adapted to remain open when actuated until said tank is substantially empty to provide a full flush of said tank, and actuating means for opening said outlet valve to flush said tank, means for aborting a full flush of said tank comprising:

a guide member attached to said outlet valve and constrained in a generally vertical position, a buoyant body adapted when unrestrained to slide freely on said member and to descend while the water level in said tank lowers, and a fixed-length connector coupled between the toilet seat and said buoyant body and adapted to transmit a

restraining force from said seat to said buoyant body when said seat is in its lowered position for preventing the descent of said buoyant body along said guide member as the water level in said tank decreases thus allowing a full flush of said tank and adapted to be relaxed when said seat is in



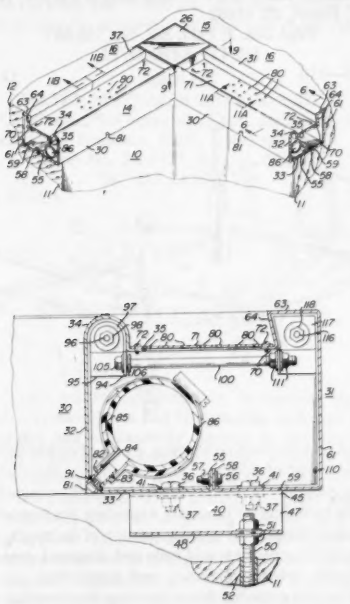
its raised position for permitting the descent of said buoyant body as the water level in said tank decreases to provide a closing force on said valve when said seat is in its raised position which force closes said valve sooner than it would for a full flush condition of said tank to provide for less than a full flush of said tank.

4,080,670

GUTTER SYSTEM

William A. van den Broek, Doylestown, Pa., assignor to KDI Sylvan Pools, Inc., Doylestown, Pa.

Filed Oct. 12, 1976, Ser. No. 731,734
Int. Cl.[2] E04H *3/20*
U.S. Cl. 4—172.17 **13 Claims**



1. A non-welded gutter system for use around the perimeter of a swimming pool for skimming the surface water of the pool and returning clean water to the pool which comprises

an open box like gutter body having

a plurality of lengths of gutter side sections detachably secured together in end to end relation,

said side sections each having a front portion with a front wall, a bottom wall and a handgrip on said front wall,

said side sections each also having a rear portion with a rear wall, a top wall and a bottom wall,

means for fastening said front and rear portions together,

said means comprising vertical lips on said bottom walls and bolts engaged therewith,

corner boxes at each corner to which one end of a pair of said front and one end of a pair of said rear portions are detachably fastened,

cover plates detachably connected to said front and said rear portions,

means for supporting the gutter body with respect to a pool for vertical and for transverse horizontal adjustment, and

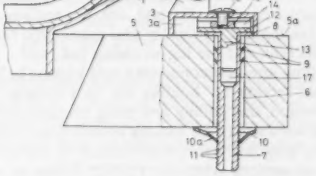
water supply means carried within said body comprising header pipes and fittings which communicate with the pool through the front wall.

4,080,671

ARRANGEMENT FOR SWINGABLE MOUNTING OF A TOILET SEAT

Paul Stähli, Jona, Switzerland, assignor to Geberit AG, Rapperswil, Switzerland

Filed Aug. 27, 1976, Ser. No. 718,263
Int. Cl.[2] A47K *13/12*
U.S. Cl. 4—236 **4 Claims**



1. A device on a toilet bowl for swingably mounting a seat ring with or without cover, including

(a) a support member having a downwardly facing cavity;

(b) a king pin carried by said support member;

(c) a mounting stud attached in an aperture in a rim portion of the toilet bowl and connected to said support member;

(d) an elongated carrier engaging said cavity and connected to said mounting stud;

(e) an undercut groove in said carrier;

(f) a nut guided in said groove as a clampable slide ring; and

(g) a set screw arranged in a bore of said support member and engaging said nut.

4,080,672

SOFA BED FOLDING FIXTURE

Paul W. Eakins, St. Louis, Mo., assignor to The Foster Brothers Manufacturing Company, St. Louis, Mo.

Filed May 12, 1977, Ser. No. 796,222
Int. Cl.[2] A47C *13/14*
U.S. Cl. 5—13 **3 Claims**

1. A folding fixture for a sofa bed comprising a head section, a body section, an intermediate section and a foot section all pivotally connected together in end-to-end relationship and adapted to be folded from an extended coplanar position to a retracted position in the sofa wherein the body section extends generally horizontally bottomwise within the sofa with the intermediate section extending upwardly from the end of the body section constituting its forward end at the front of the sofa and with the foot section extending generally horizontally

rearward from the upper end of the intermediate section, said fixture having at each side thereof;

a support adapted to be mounted on the base of the sofa at the respective side thereof;

means for locking the foot section in its retracted position;

linkage interconnecting said support and said locking means;

a folding leg for supporting the body section;

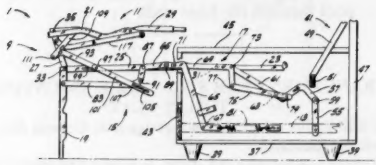
a folding leg for supporting the foot section;

said locking means comprising,

a link for actuating the leg of the body section;

a first bellcrank pivoted on the side of the body section and having a pivotal connection at its rearward end to said linkage and at its forward end to said leg-actuating link;

a second locking bellcrank pivoted intermediate its ends to said intermediate section and having at its rearward end a pin and slot connection with the side of the body section



forward of said first bellcrank, the forward end of said locking bellcrank extending generally downwardly and forwardly when said folding fixture is in its extended position;

a locking link interconnecting said locking bellcrank and said leg-actuating link, said locking link being pivoted at its forward end to said locking bellcrank and having at its rearward end a pin and slot connection with the leg-actuating link forward of said connection between the first bellcrank and the leg-actuating link; and

a pulling arm interconnecting said locking bellcrank and the foot section for holding the foot section in said folded position, said pulling arm being pivotally connected to the forward end of the locking bellcrank and extending generally diagonally across the corner of the intermediate and foot sections when the folding fixture is in its retracted position.

4,080,673

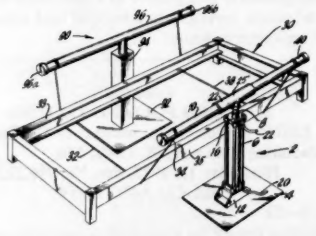
BED ROCKING MECHANISM

Morris J. Weisler, 358 Sharon Dr., (Lakewood North) New Orleans, La. 70124

Continuation of Ser. No. 631,626, Nov. 13, 1975. This application Feb. 15, 1977, Ser. No. 768,910

Int. Cl.[2] A61G *7/00, 7/10*

U.S. Cl. 5—62 **12 Claims**



1. Portable apparatus for imparting a rocking motion to a bed having a first and second substantially opposed sides including:

first support means having a base, a cylinder having a first end mounted on said base and a second end, a piston reciprocally movable within said cylinder, a piston rod attached to said piston at a first end and having a second end extending through said second end of said cylinder, and a first member attached to said piston rod at a point adjacent to the second end of said piston rod, said first member being movable by the motion of said piston rod;

second support means including a second member and a base to support said second member;

linking means to operably connect said first member to said first side of said bed and said second member to said second side of said bed;

a source of pressurized fluid;

a reversing switch having an input connected to said source of pressurized fluid and a first and second outputs;

first and second valves connected respectively to said first and second outputs of said reversing switch, said first valve being connected to said first end of said cylinder and said second valve being connected to said second end of said cylinder; and

timing means to cause said reversing switch alternately to direct said pressurized fluid through said first and said second outputs to cause said first member to move so as to alternately lift and lower said first side of said bed.

4,080,674

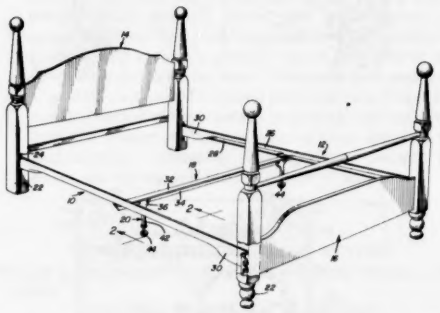
BED RAILS WITH CENTER BAR SUPPORT

Harry Fredman, and Irving Fredman, both of 908 SW. Washington St., Peoria, Ill. 61602

Filed Jan. 3, 1977, Ser. No. 758,697

Int. Cl.[2] A47C *19/12*

U.S. Cl. 5—310 **12 Claims**



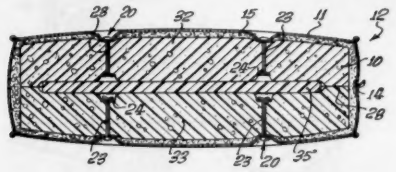
1. A bed construction comprising a pair of end boards, a box spring and a pair of side bed rails mounted on the end boards extending generally in parallel relation to each other with each of the rails including an inwardly extending horizontal flange, and a vertical flange over a major portion of its length, a single cross bar interconnecting said rails and disposed generally in perpendicular relation thereto, and supporting leg means mounted on said cross bar for supporting the cross bar and the bed rails to prevent downward sagging of the bed rails and box spring supported thereon with the cross bar preventing outward deflection of the bed rails as well as twisting of the bed rails, thereby providing a firm support for a box spring supported on the bed rails, said supporting leg means being disposed adjacent each of the bed rails and connected rigidly to the cross bar.

4,080,675

CUSHION CONSTRUCTION

Vincent C. Kanowsky, Newport Beach, and Raoul Canas, Buena Park, both of Calif., assignors to Allied Upholstery Mfg., Inc., Lynwood, Calif.

Filed Mar. 8, 1976, Ser. No. 664,959
Int. Cl.[2] A47C *23/00*
U.S. Cl. 5—345 R 4 Claims



1. In a movable cushion having a top, a bottom and four sides, the combination of:

a pad comprising a block of cushion material with a central separation parallel to said top and bottom through at least one side of said block and defining upper and lower portions of said block;

a cover enclosing said pad and having an opening in one side for insertion and removal of said pad, said separation at said one side of said block being adjacent said opening; and

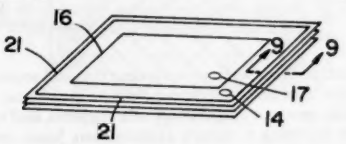
a plurality of buttons providing dimples in said cover, each of said buttons comprising a pin with head and body, with the head on the exterior of said cover and with the body projecting through said cover and one of said upper and lower portions of said block only into said central separation of said pad, and a fastener in said separation engaged with the inner end of said pin, with said fastener and inner end of said pin accessible through said cover opening.

4,080,676

WATER MATTRESS CONSTRUCTION

David P. Calleance, San Francisco, Calif., assignor to Sandra L. Calleance, San Francisco, Calif., a part interest

Filed Jan. 21, 1977, Ser. No. 761,499
Int. Cl.[2] A47C *27/08*
U.S. Cl. 5—371 2 Claims



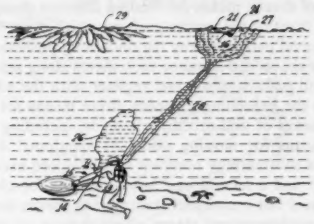
1. A water mattress construction, comprising three web portions in vertically stacked relationship, said web portions being parallel and substantially identical in size and shape; a continuous edge weld joining the outer edges of said web portions in sealing fashion; a second, continuous weld spaced inwardly from said edge weld, joining the upper and medial ones of said web portions in sealing fashion; said mattress including a water chamber defined by said medial and the lower web portions and said edge weld; and an upper peripheral air chamber defined by said edge weld and said second weld, and by said upper end medial web portions, said air chamber being buoyantly supported by the portion of said water chamber disposed thereunder; a water valve disposed within the perimeter of said second weld, extending through said upper and medial web portions to said water chamber; and an air valve disposed between said edge weld and said second weld and extending through said upper web portion to said air chamber.

4,080,677

PORTABLE DIVER DISTRESS SIGNALLING DEVICE

Carlton L. Koehler, Box 236, Avalon, Calif. 90704

Filed Feb. 11, 1977, Ser. No. 767,697
Int. Cl.[2] B63C *9/21*
U.S. Cl. 9—9 10 Claims



1. A portable diving distress signalling device comprising:

a backing having a mounting surface and formed of a sheet of water impermeable material;

strapping fastened to said backing for securing said backing to a diver;

a water impermeable protective cover removably sealed to said backing in a waterproof fashion to define a water free cavity between said backing and said protective cover at said mounting surface of said backing and providing a release tab which may be used to strip said protective cover from said backing;

a first water permeable packet of marker dye secured to said backing material within said cavity.

a second water permeable packet of marker dye located within said cavity and disassociated from said backing; and

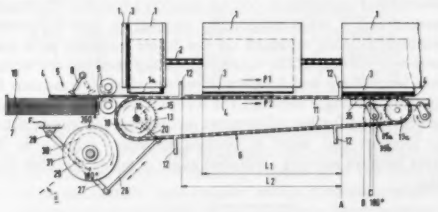
a float attached to said second packet of dye for carrying it to the surface of a body of water independent of said backing when said protective cover is stripped from said backing material beneath the surface of the water.

4,080,678

APPARATUS FOR ATTACHING SHEETS TO GROUPS OF LEAVES IN BOOKBINDING MACHINES

Hans Müller, Zofingen, Switzerland, assignor to Grapha-Holding AG, Hergiswil, Switzerland

Filed Sep. 1, 1976, Ser. No. 719,579
Claims priority, application Switzerland, Sep. 9, 1975, 11696/75
Int. Cl.[2] B42C *19/00*
U.S. Cl. 11—1 AD 14 Claims



1. In a bookbinding machine wherein sheets of paper or the like are attached to adhesive-coated edge faces of groups or leaves, a combination comprising a first conveyor having a plurality of equally spaced grippers for said groups and means for transporting said grippers at a constant first speed along a first endless path having an elongated portion along which said grippers move in a predetermined direction; a second conveyor having a plurality of equally spaced pushers and means

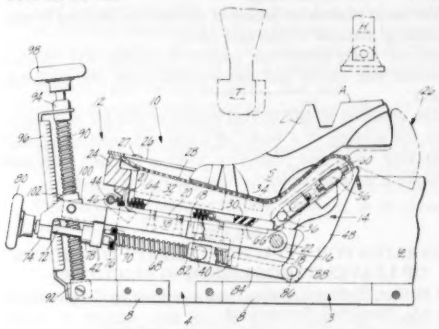
for transporting said pushers along a second endless path having an elongated portion which is adjacent and substantially parallel to said portion of said first path and along which said pushers move in said direction and alternate with said grippers so that each gripper which moves along said portion of said first path preceeds a pusher in said portion of said second path; a source of sheets; means for feeding discrete sheets from said source in front of successive pushers which enter said portion of said second path whereby the oncoming pushers entrain the respective sheets and advance such sheets along said portion of said second path in substantial register with the edge faces of groups in the preceding grippers; drive means for said transporting means of said second conveyor, including a first unit having means for moving said last mentioned transporting means at a substantially constant second speed exceeding said first speed and a second unit having means for changing the speed of said last mentioned transporting means during a plurality of predetermined stages of movement of said pushers along said portion of said second path; and means for transferring sheets from said portion of said second path into contact with the adhesive-coated edge faces of groups in the preceding grippers during a selected stage of movement of the respective pushers along said portion of said second path.

4,080,679

COMPREHENSIVE PAD BOX

Albert Edward Lovett, Frisby-on-the-Wreake, England, assignor to USM Corporation, Boston, Mass.

Filed Oct. 29, 1976, Ser. No. 736,704
Int. Cl.[2] A43D *89/00, 63/00*
U.S. Cl. 12—38 **3 Claims**



1. A pad box for applying pressure to the bottom of a shoe comprising a frame, conformable material engageable with the shoe bottom, means mounted on the frame for supporting said material and including in pivotal relation a forepart supporting member and a waist supporting member, a heel supporting member movably mounted on the frame adjacent to a rearward end portion of the waist supporting member for adjustment lengthwise and heightwise of the shoe, mechanism for adjusting the angle between the forepart and waist supporting members, and further adjustment mechanism for jointly tilting the forepart and waist supporting members relative to the frame without altering a selected angle of adjustment between them.

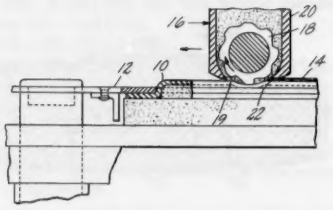
4,080,680

METHOD FOR STIFFENING SHOE UPPERS

Adolph Michael Chaplick, Hudson, N.H., assignor to USM Corporation, Boston, Mass.

Filed Jul. 2, 1976, Ser. No. 702,870
Int. Cl.[2] A43D *87/00;* **B05B** *3/02*
U.S. Cl. 12—146 D **5 Claims**

1. In a method of stiffening selected areas of an end portion of a shoe upper including the steps of applying a coating of hot viscous molten synthetic polymeric material to the surfaces of said selected area, the synthetic polymeric material having a viscosity low enough to wet and adhere to said surface but sufficiently high that it will substantially not penetrate the material of said sheet and cooling the molten material to form a stiff resilient adherent layer; the improvement which consists in applying as said molten coating an intimate mixture of vis-



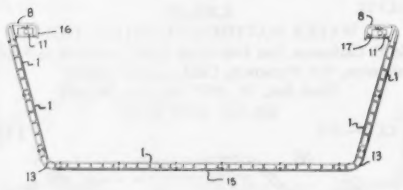
cous molten thermoplastic synthetic polymeric material having a melt viscosity at 180° C. of from about 15,000 to about 90,000 cps. (as determined on a Brookfield Thermosel Viscometer) with a #27 spindle and ½ hour time and from about 10 to about 50% by weight based on the weight of said coating of solid glass spheres having diameters capable of passing a U.S. Sieve Number 325 said coating having a thickness of from about 0.010 to about 0.050 inches.

4,080,681

BRIDGE

Hans H. Olrik, Landemaerket 9, DK-1119, Copenhagen K, Denmark, and Hans C. L. Jacobsen, c/o Christiani & Nielsen S.A., Avenida Rio Branco 311, 9 and., Rio de Janiero, Brazil

Filed Mar. 29, 1977, Ser. No. 782,328
Int. Cl.[2] E01D *1/00*
U.S. Cl. 14—1 **9 Claims**



1. A bridge beam section comprising first and second spaced linear side elements, a bottom element positioned between lower edge portions of said linear side elements, said linear side elements including a unitary extruded box beam comprising two parallel plate components consisting of an inner plate and an outer plate and internal transverse walls perpendicular to and connecting said plate components and lower curved corner elements formed of extruded metal having an inner corner plate and an outer corner plate joined by transverse internal walls for connecting the lower edges of said linear side elements to said bottom element.

4,080,682

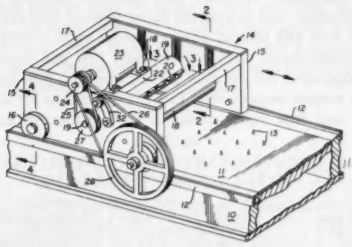
MEAT CLEANING MACHINE

Pete Blaire, 175 McKinley Ave., Mercer, Pa. 16137

Filed Jan. 31, 1977, Ser. No. 764,273
Int. Cl.[2] A22B *17/08*
U.S. Cl. 15—3.1 **2 Claims**

1. A meat cleaning machine comprising in combination a base having a surface area for receiving meat to be cleaned and a carriage having cleaning means engagable with said meat arranged on said base for reciprocal movement relative thereto, said cleaning means including at least one roll ar-

ranged transversely of said carriage, vertically movable journals engaged on the ends of said roll, guide configurations on said carriage for receiving journals, means for rotating said roll, at least one blade arranged longitudinally of said roll so as to present an edge for engaging and scraping said meat when said roll is revolved, at least one secondary roll arranged transversely of said carriage in spaced relation to said first mentioned roll, secondary vertically movable journals engaged on the ends of said secondary roll, secondary guide configurations on said carriage for receiving said secondary journals and spring means normally urging said secondary journals and secondary roll toward said base, said secondary roll being arranged to engage and hold said meat in position on said surface area.

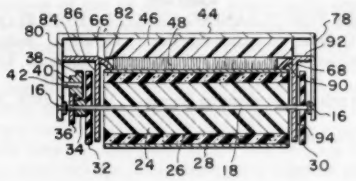


4,080,683

CHALK BOARD ERASER

Chong Sun Yi, 1232 North Britain Rd., Apt. 132, Irving, Tex. 75061

Filed Nov. 22, 1976, Ser. No. 743,909
Int. Cl.[2] A47L *11/04*
U.S. Cl. 15—98 **9 Claims**



1. A hand-held self cleaning chalkboard eraser comprising, in combination:

a case;

a roller rotatably mounted in the case and including an outer surface made of a chalk erasing material for removing chalk from the chalkboard;

a stationary means mounted in the case for engaging the erasing material of the roller whereby loose chalk is removed from the erasing material as the roller rotates with respect to the case; and wherein said means does not absorb chalk at the engaging surface;

at least one chalk trough for storage of loose chalk removed from the chalkboard situated to receive the loose chalk as it is removed from the erasing material; and

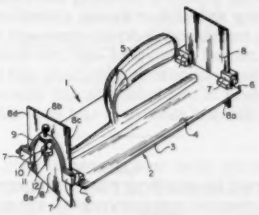
step-down gearing means connected to said roller for slowing the rotation of the roller as it is moved along the surface of a chalkboard so that there is sliding between the roller and the chalkboard when the eraser is moved across the chalkboard in a direction transverse to the roller axis.

4,080,684

COATING APPLICATOR

Gaêtan Venditti, 10 rue Frere Benoit, Oullins (Rhone), France

Filed Jun. 2, 1976, Ser. No. 692,112
Claims priority, application France, Jun. 3, 1975, 75 17849
Int. Cl.[2] B05C *11/00*
U.S. Cl. 15—104 S **8 Claims**



1. A tool for applying a flowable mass to a surface to be coated, comprising:

a pair of parallel cheek plates each having a front edge, a rear edge and a bottom edge, the front and rear edges of said cheek plates being parallel to one another and inclined to their bottom edges at an angle of less than 90°;

a pair of supports each including a front slide and a rear slide engaging said front and rear edges of a respective cheek plate;

a generally rectangular blade between said cheek plates bounded by a leading edge and a trailing edge transverse to said cheek plates and a pair of lateral edges gripped by said slides, said leading edge being elevated more than said trailing edge above the level of said bottom edges;

adjustable couplings between said cheek plates and said supports for varying the elevation of said leading and trailing edges above said level; and

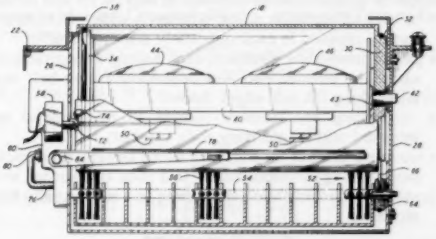
handle means on an upper face of said blade.

4,080,685

HEADLIGHT CLEANING SYSTEM

Charles C. Vanderpool, R.D. No. 1, Waverly, N.Y. 14892

Filed Sep. 27, 1976, Ser. No. 726,804
Int. Cl.[2] B60S *1/44, 1/46*
U.S. Cl. 15—250.01 **10 Claims**



1. A cleaning system for removing matter obscuring the beam path of an automobile headlamp, said system comprising:

(a) at least one electric headlamp supported at the front end of an automobile upon support means permitting selective adjustment of the angle of the headlamp beam relative to the automobile;

(b) a transparent, cylindrical member having a closed end and an open end encircling said headlamp and support means with the axis of the cylinder substantially perpendicular to the beam axis;

(c) a circular plate fixedly supported with respect to said headlamp and support means in covering relation to said open end of said cylindrical member;

(d) sealing means effecting a substantially moisture and dust impervious seal between said plate and said open end, said

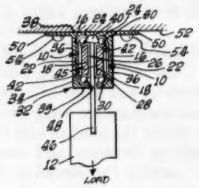
sealing means allowing rotation of said cylindrical member relative to said plate;
(d) powder-driven means for effecting selective rotation of said cylindrical member about its axis;
(e) washing means adapted to remove extraneous matter from the external surface of said cylindrical member during said selective rotation thereof; and
(f) means for relatively mounting and connecting all of said headlamp and support means, cylindrical member, plate, sealing means, power-driven means and washing means to allow manual removal of said cylindrical member from encircling relation to said headlamp and support means for adjustment of said beam axis, and manual replacement of said cylindrical member in said encircling relation.

4,080,686

STRUCTURAL SUPPORT MOUNTING MEANS FOR PRECISION, TELESCOPING, LINEAR SLIDE MECHANISMS

Magnus F. Hagen, 434 Panorama Dr., Laguna Beach, Calif. 92651

Filed May 12, 1976, Ser. No. 685,637
Int. Cl.² E05D *13/02*
U.S. Cl. 16—88 **10 Claims**



1. A structural support mounting means in combination with precision, telescoping, linear, ball-bearing slide mechanisms having inner and outer slide members and ball bearings disposed therebetween, wherein the improvement comprises:
an elongated rail housing having side and end walls defining a longitudinal barrel therein, wherein at least one end wall thereof is provided with a longitudinal slot communicating with said barrel;
a pair of support cradles disposed in said barrel and formed in each of said side walls, wherein a slide mechanism is fixedly retained in each oppositely disposed cradle;
a pair of inner slide members, each having a longitudinally extending bottom wall and oppositely facing ball raceways along the side edges thereof;
a reinforcing bar member formed to be received and mounted within said inner slide member;
a mounting bracket for attaching a load thereto, said bracket being arranged to move with said slide mechansim; and
means for attaching said rail housing to a substantially fixed structure.

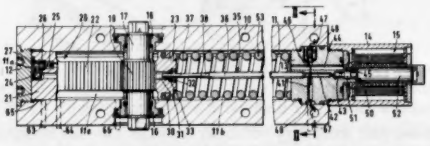
4,080,687

DOOR CLOSER

Dietrich Jentsch, Ennepetal, Germany, assignor to Dorma-Baubeschlag G.m.b.H. & Co. K.G., Ennepetal-Voerde, Germany

Filed Sep. 15, 1976, Ser. No. 722,921
Claims priority, application Germany, Sep. 19, 1975, 2541790
Int. Cl.² E05F *3/10*
U.S. Cl. 16—52 **15 Claims**

1. In an arrangement for controlling the position of a door element which is mounted for movement relative to an opening of a wall element between a fully open position and a closed position through a predetermined partly open position, a combination comprising a cylinder-and-piston unit including a cylinder member and a piston member each connectable to one of the elements, said cylinder member defining an elongated chamber and said piston member being located in said chamber to subdivide the same into two compartments for a damping fluid and so displaceable longitudinally of said chamber as to assume therein an end position in the fully open position of the door element, an intermediate position in the predetermined partly open position of the door element, and a rest position in the closed position of the door element; biasing means interposed between said cylinder member and said piston member and urging the latter toward said rest position thereof; first and second passage means each communicating said compartments with one another; first and second valve means operative for opening and closing said first and second passage means, respectively; first closing means for selectively closing said first valve means in any position of said piston



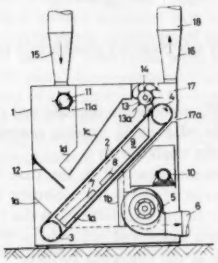
member in said chamber to thereby interrupt flow of the damping fluid through said first passage means; and second closing means for closing said second valve means only in such positions of said piston member in said chamber which are between said intermediate position and said end position thereof to thereby interrupt the flow of the damping fluid through said second passage means, whereby the damping fluid is expelled by the action of said biasing means on said piston member from one of said compartments into the other compartment through at least said second passage means when said piston member is between said rest position and said intermediate position thereof with attendant movement of the door element toward said closed position whereas the damping fluid holds said piston member against displacement when the latter is between said intermediate position and said end position and said first valve means is closed.

4,080,688

DEVICE FOR CLEANING TEXTILE FIBER FLOCKS

Walter Oellers, Monchen-Gladbach, Germany, assignor to Trutzschier GmbH & Co. KG, Monchen-Gladbach, Germany

Filed May 26, 1976, Ser. No. 689,981
Claims priority, application Germany, May 31, 1975, 2524245
Int. Cl.² D01G *37/00*
U.S. Cl. 19—204 **2 Claims**



1. A device for cleaning textile fiber flocks, comprising: an endless continuously running conveyor band of a material that is penetrable by air, means for continuously feeding textile fiber flocks onto the upper run of said conveyor band and means for sucking air from below through said upper conveyor run when covered by a layer of the fiber flocks, grate means disposed above the feeding end of said conveyor band and a

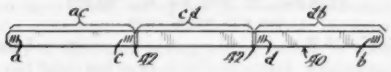
first roller having wings, disposed below a supply for the fiber flocks, provided above said grate means, said second roller running at a speed adapted to accelerate the fiber flocks in the direction of said grate means, and a second rotatable roller having elastically very flexible leaves that protrude freely in radial directions and are substantially parallel to the axis of said roller above said upper conveyor run, in proximity of the delivery end of said conveyor band and running at such a high speed that the circumferential speed of the ends of said leaves is somewhat greater than the speed of said conveyor band and running in the same direction in which said upper conveyor run moves, said roller being arranged in such a manner that said ends of the leaves strike a point of said conveyor band during their rotation that is not supported.

4,080,689

REUSABLE CONNECTABLE STRAP SEGMENT WITHIN A LARGER STRAP SEGMENT

William A. Meier, Hoffman Estates, Ill., assignor to Signode Corporation, Glenview, Ill.

Filed May 24, 1976, Ser. No. 689,075
Int. Cl.² B65D *63/02*
U.S. Cl. 24—20 EE **11 Claims**



1. A one piece strap segment comprising (a) a primary strap segment adapted to define a first loop about material and adapted to be coupled by a first sealless strap connection of predetermined strength between overlapped strap ends of the primary strap segment and (b) an inner strap segment of predetermined length contained within said primary strap segment and adapted to define a second, smaller loop about material and adapted to be coupled by a second sealless strap connection of predetermined strength between overlapped strap ends of the inner strap segment, said primary strap segment having on each end thereof an outer array of a limited predetermined number of longitudinally spaced shear lock joint elements, the joint elements of one of said outer arrays being adapted to interlock with the joint elements of the other outer array, said inner strap segment including and defined by a pair of interior arrays of a limited predetermined number of longitudinally spaced shear lock joint elements, the joint elements of one of said interior arrays being adapted to interlock with the joint elements of the other interior array, said interior arrays being positioned between said outer arrays and defining between them the major portion of said inner strap segment, said interior arrays further defining a strap severance region adjacent each interior array exterior of said inner strap segment, said major portion of the inner strap segment being constructed of continuous, solid strap whereby

(a) said inner strap segment can be severed at each end from said primary strap segment in said severance regions for forming said second loop and for being coupled by said second sealless strap connection of predetermined strength which is properly made by the interlocking of all said limited predetermined number of interior array joint elements between overlapped ends of the inner strap segment, said properly made second sealless connection being readily ascertainable upon visual inspection of said interior array joint elements,

(b) the major portion of the inner strap segment presents surfaces free of snagging apertures, and

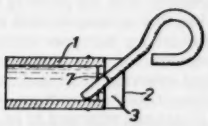
(c) the major portion of the inner strap segment is free of joint element stress concentration discontinuities which can serve as propagation points of structural failure under applied loading.

4,080,690

QUICK DISCONNECT COUPLING

Harvey W. Vaux, 18 Young Street, Dudley Park, South Australia, 5008, Australia

Filed Mar. 4, 1976, Ser. No. 664,035
Int. Cl.² A44B *17/00;* **A43C** *11/08*
U.S. Cl. 24—201 R **3 Claims**



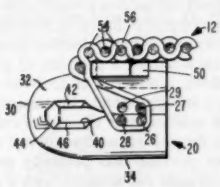
1. A coupling comprising a hollow body portion with a closed end, an aperture formed by an elongated slot of uniform width passing through the closed end and opening into the hollow body portion, and a locking member formed of a wire like material having a thickness less than the width of the slot, the locking member having a locking portion formed by a small loop of the material bent back on itself at an end of the wire, the small loop being substantially formed in one plane, the major dimension of the loop having a width less than the length of the slot but greater than the width of the slot, and a further larger loop at the other end in a plane at right angles to the plane of the smaller loop for the attachment of a cord or the like, the larger loops being substantially closed to prevent inadvertant separation from an attached cord or the like, said locking member being substantially straight between the two loops, whereby the locking portion formed by the small loop may be passed through the slot and on rotation of 90° the locking portion engages the end of the body portion adjacent the slot, so that when tension is applied by a cord or the like to the locking member at an angle to the body portion with the slot being generally aligned with the line of the force being applied and the locking member being tilted such that its long dimension is substantially in the plane of the slot, the locking member is locked in the body portion by virtue of having its plane transverse to the plane of the slot while the plane of the larger loop is in the plane of the slot.

4,080,691

MOLDED ELEMENT TAPE SUPPORT FOR INVISIBLE SLIDE FASTENER AND METHOD OF MANUFACTURE

George B. Moertel, Conneautville, Pa., assignor to Textron Inc., Providence, R.I.

Filed Sep. 17, 1976, Ser. No. 724,222
Int. Cl.² A44B *19/06*
U.S. Cl. 24—205.1 R **10 Claims**



1. A woven slide fastener stringer for an invisible-type slide fastener comprising

a train of coupling elements having connecting thread means and a plurality of polymer coupling elements molded on the connecting thread means,

each of said coupling elements having a head portion and leg means extending from the head portion,

said connecting thread means having spaced segments imbedded in the respective leg means,

said coupling elements further having wing portions extend-

ing into the spaces between the leg means of adjacent coupling elements on an upper side of the coupling elements,

each of said wing portions having one edge adjacent a respective head portion and generally extending in a line parallel the connecting thread means,

a woven tape having a plurality of warp threads and a weft thread interwoven with the plurality of warp threads,

some of said plurality of warp threads and said interwoven weft thread overlying the upper side of the leg means and the wing portions, and

said weft thread extending from said one edge of the wing portions adjacent the head portions, around the connecting thread means and returning to said one edge.

4,080,692

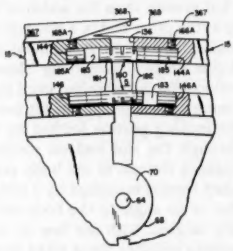
TENTER GUIDE RAIL GAP CROSSING MECHANISM

Henry Parrillo, Johnston; John Sherman Harrington, Warwick, and Glenn Howard Curtis, North Kingstown, all of R.I., assignors to Marshall and Williams Company, Providence, R.I.

Division of Ser. No. 703,577, Jul. 8, 1976. This application Jul. 18, 1977, Ser. No. 816,750

Int. Cl.[2] D06C *3/04*

U.S. Cl. 26—91 **1 Claim**



1. Apparatus for stretching web material by use of tentering clips and providing a uniform distribution of transverse stretching forces comprising a frame, a plurality of cross members secured to said frame, a plurality of bearings fastened to each cross member, a plurality of shafts, one for each cross member, each shaft having a right hand thread and a left hand thread, means rotatably mounting said shafts in said plurality of bearings, a plurality of saddles, two for each cross member, means slidably mounting said saddles to said cross members, a plurality of nuts, one secured in each saddle, one nut of one saddle of an associated shaft connected to a right hand thread, alternately, another nut of the other saddle of the shaft connected to a left hand thread, whereby rotation of the shaft in one direction draws the saddles toward each other and rotation of the shaft in an opposite direction separates said saddles , a plurality of blocks, one for each saddle, means slidably mounting a block in each saddle, a plurality of pivot pins, one fastened in each block, a plurality of grooved guide straight rail sections having a straight tenter clip engaging faces, pivotally mounted to said saddles, with the end of one rail being pivotally mounted to the end of an adjacent rail through said pivot pins, thereby to provide two pivotally connected adjacent grooved guide straight rail sections with a gap therebetween, said plurality of grooved guide straight rail sections forming two closed loop paths to accommodate, respectively, two closed loop tentering chains, said shafts providing incremental adjustment between pairs of rails controlled by the same shaft and incremental adjustments between adjacent rails, that improvement in which means between the ends of adjacent grooved guide straight rail sections provide a gap crossing mechanisms, said means yielding on an arc, having a radius with the center located in the center of the pivot pin, upon relative pivotal movement between adjacent grooved guide straight rail sections, said means providing a smooth arcuate connection between the straight tenter clip engaging faces having various degrees of diverging and converging relationship with respect to one another, said means between the ends of adjacent grooved guide straight rail sections comprises a bar consisting of two compatible half sections which slidably engage, each half section comprising a head, a sliding surface terminating at a shoulder formed in said head, a tenter clip track surface on one side of said sliding surface and a plurality of slits in the surface on the side opposite said tenter clip track surface, a front chamber and a rear chamber provided, respectively, in opposite ends of each grooved guide straight rail section, said bar located between opposite ends of adjacent grooved guide straight rail sections, one head located in a front chamber and the other head located in a rear chamber with said tenter clip track surface forming a smooth connection between the tenter clip engaging surfaces of the respective adjacent pivotally connected grooved guide straight rail sections, and means fastening the respectively heads in the respective chambers, whereby relative pivotal movement between adjacent grooved guide straight rail sections arcuately bends said bar across said plurality of slits.

4,080,693

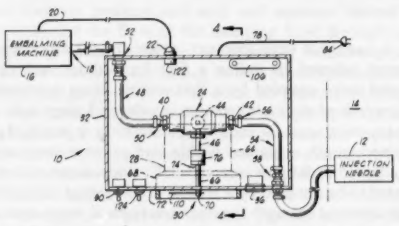
EMBALMING MACHINE FLOW CONTROL APPARATUS

Mike D. Pruitt, 213 E. Madison, McAlester, Okla. 74501

Filed Dec. 20, 1976, Ser. No. 752,871

Int. Cl.[2] A01N *1/00*

U.S. Cl. 27—24 R **5 Claims**



1. In combination with an injection needle disposed proximate to a working area and an embalming machine disposed remote from the working area, the embalming machine having an embalming fluid outlet, a flow control apparatus comprising:

a valve assembly having an inlet, an outlet and a valve movable between a closed position preventing fluid flow between the inlet and the outlet, and an open position allowing fluid flow between the inlet and the outlet;

an inlet conduit connected between the embalming fluid outlet of the embalming machine and the inlet of the valve assembly;

an outlet conduit connected between the outlet of the valve assembly and the injection needle;

valve control means disposed proximate to the working area, the valve control means having an open control portion for producing an open control signal in response to the actuation thereof, and a close control portion for producing a close control signal in response to the actuation thereof;

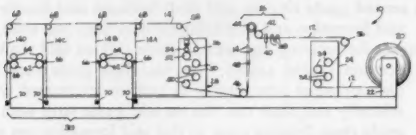
valve actuating means connected to the valve and to the valve control means, the valve actuating means receiving the open control signal and the close control signal, moving the valve toward the open position in response to receiving the open control signal, and moving the valve toward the closed position in response to receiving the close control signal; and

indicating means connected to the valve for providing an output indication of the position of the valve relative to the open and closed positions.

4,080,694
METHOD FOR SEPARATING AND WINDING PRE-TREATED TIRE CORD

Thomas W. Moore, Columbia, S.C.; Richard A. Hager, College Park, Ga., and Robert J. Clarkson, Winnsboro, S.C., assignors to Uniroyal, Inc., New York, N.Y.

Filed Jul. 17, 1974, Ser. No. 489,229
Int. Cl.[2] D02H *9/00*
U.S. Cl. 28—170 9 Claims

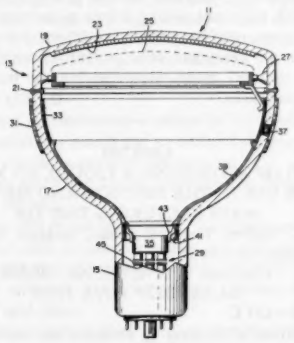


1. A method of gathering coated reinforcing cord from a fabric constituted of longitudinally running warp cords numbering in a range of approximately 6 to 30 per inch and laterally running picks numbering in a range of approximately 2 to 6 per inch and interlaced with said warp cords, said method comprising treating said fabric as a unit with a liquid whereby said warp cords and picks are coated with said liquid and dried, and then advancing the treated fabric under tension lengthwise of said warp cords, tearing said picks into substantially equal lengths while advancing said fabric to divide the latter into a plurality of tapes each having a lesser number of warp cords than said fabric and picks of reduced length, winding said tapes into respective tape packages, unwinding each of said tape packages individually while advancing the components warp cords thereof lengthwise under tension, dislodging said picks from each of said tapes while advancing the latter, and winding said warp cords freed from said picks into respective packages.

4,080,695
METHOD OF DEPOSITING TRIPARTITE COATING SYSTEM FOR A CATHODE RAY TUBE

Anthony V. Gallaro, Auburn, and G. Norman Williams, Seneca Falls, both of N.Y., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Continuation-in-part of Ser. No. 683,647, May 6, 1976, abandoned, which is a division of Ser. No. 600,784, Jul., 1975, abandoned. This application Jun. 24, 1977, Ser. No. 809,642
Int. Cl.[2] H01J *9/02*
U.S. Cl. 29—25.13 4 Claims



1. The method for disposing a tripartite electrical connective-resistive system of related coating areas to discrete areal portions of the interior surface of a cathode ray tube envelope formed of a viewing panel member sealed to an integrated funnel-neck section, the three coatings being applied to the funnel-neck section of the envelope before the screen-containing panel member is attached thereto or the electron generating assembly positioned therein, said method comprising the steps of:

applying a substantially perimetrical deposition of a first low resistive electrical conductive coating in the form of a substantially liquid composition to substantially the forward region of the integrated funnel-neck portion of the envelope;

applying a narrow band-like circumferential deposition of a second low resistive electrical conductive coating in the form of a substantially liquid composition on the forward end of said neck member in the region subsequently contacted by the terminal contactors on said electron generating assembly, said second coating being spaced from said first coating effecting an intervening space therebetween;

drying said disposed first and second low resistive coating depositions;

applying a substantially perimetrical deposition of a high resistive electrical conductive coating to said intervening space in a manner to make contact with said first and second coatings, said high resistive coating being a homogeneous mixture of an amorphous substantially insulative frit material having a softening point in the range of substantially 350° to 450° C admixed with at least one particulate material selected from the group consisting essentially of cadmium oxide, indium oxide and copper oxide said particulate frit material being within the range of substantially 1.0 to 35.0 microns in size, said particulate oxide being within the range of substantially 1.0 to 10.0 microns in size, said oxide being present in said mixture within the range of substantially 35 to 65 weight percent depending upon the resistive value desired;

applying a continuous bead of sealing frit around the panel-seal edge of said funnel;

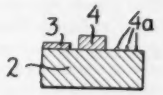
positioning said viewing panel upon said seal-edge with said sealing frit therebetween to provide a panel-funnel assembly; and

heating said panel-funnel assembly to approximately 450° C for a period of time to vitrify said sealing frit and effect jointure therebetween, said heating additionally producing an amorphous transformation of said high resistive coating and effecting degasification of the components of said tripartite system.

4,080,696
METHOD OF MAKING PIEZOELECTRIC VIBRATOR

Hironori Shimatsu, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Japan

Filed Jan. 28, 1977, Ser. No. 763,711
Claims priority, application Japan, Jan. 29, 1976, 51-8632
Int. Cl.[2] H01L *41/22*
U.S. Cl. 29—25.35 4 Claims



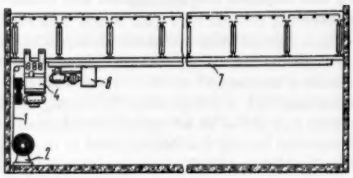
1. A method of making a piezoelectric vibrator which comprises shaping a vibrator from a quartz crystal wafer by photo-etching technique, applying film electrodes and masses for frequency adjustment by depositing a layer of chromium and an overlying layer of gold on said vibrator and keeping said vibrator with said deposits thereon in a high vacuum and high temperature environment for a predetermined time sufficient to eliminate distortions caused by said photo-etching and metal deposition.

4,080,697

ARRANGEMENT FOR INSTALLATION OF RIBBON-TYPE ENCLOSING STRUCTURE

Boris Danilovich Vetrov, ulitsa Chaikovskogo, 56, kv. 8, Leningrad; Boris Eliseevich Kiselev, Volgogradsky prospekt, 137, korpus 1, kv. 91, Moscow; Vladimir Ivanovich Kostjukovich, ulitsa Sofiiskaya, 31, kv. 149, Leningrad; Leonid Nikolaevich Mikhailovsky, ulitsa Novo-Alexandrovskaya, 21, kv. 1, Leningrad; Julia Nikitichna Ryabikova, ulitsa Sedova, 52, kv. 1, Leningrad, and Viktor Ivanovich Trofimov, ulitsa Zoologicheskaya, 30, kv. 68, Moscow, all of U.S.S.R.

Filed Aug. 4, 1976, Ser. No. 711,519
Int. Cl.² B21B *15/00;* B23P *23/04, 25/00*
U.S. Cl. 29—33 K 5 Claims



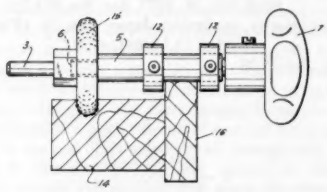
1. An arrangement for installation of ribbon-type enclosing structures comprising: a coiled ribbon with an uncoiling means; a bending mechanism for shaping the ribbon to obtain a profile corresponding to the shape of the board elements of girders, said mechanism having a rigid frame disposed beneath said ribbon drawn between two adjacent girders, and two bilaterally symmetrical bending heads mounted to both ends of said frame and rigidly connected to said girders; means for crimping the bent edges of the ribbon, said means comprising a housing having a crimping head and a cross-piece movably mounted to said girder and connected with both ends thereof to said housing, one end of said cross-piece being articulated to said housing, and a clamping member, the other end of said cross-piece being connected to said housing by means of said clamping member.

4,080,698

ACCESSORY FOR A HAND DRILL

Carl Zenses, Raspelweg 10, 5630 Remscheid 15, Germany

Filed Oct. 12, 1976, Ser. No. 731,502
Claims priority, application Germany, May 8, 1976, 2620383
Int. Cl.² B23D *67/00;* B27C *5/00*
U.S. Cl. 29—76 R 11 Claims



1. In combination with a hand-held electric drill having a chuck defining a chuck axis and adapted to rotate about said chuck axis;

a tool having a tool axis, a material-removing formation, a shank extending axially to one side of said formation and receivable within said chuck with said axes aligned, and a shaft extending axially to the other side of said formation;

a handle;

means for securing said handle to said shaft for force transmission between said handle and said tool radially of said tool axis and for relative freedom of motion of said tool and said handle on rotation of said tool about said chuck axis;

a first guide ring on said shaft between said handle and said formation and projecting radially from said shaft;

means for securing said first guide ring on said shaft in any of a plurality of axially offset positions thereon;

a guide strip on said workpiece extending therealong in a guide direction adjacent a region of said workpiece to be worked by said formation, said guide strip having a predetermined width;

a second guide ring on said shaft between said handle and said formation and projecting radially from said shaft; and

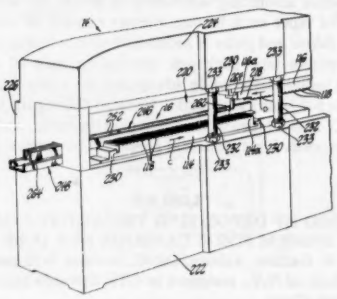
means for securing said second guide ring on said shaft in a position spaced axially from said first guide ring by a distance equal substantially to said predetermined width, whereby said shaft can rest on said guide strip with said guide rings flanking same so that said formation can work said region as said tool is displaced along said guide strip.

4,080,699

APPARATUS AND METHOD FOR BURNISHING GEARS

Marvin R. Anderson, Grosse Pointe Shores, Mich., assignor to Anderson-Cook, Inc., Fraser, Mich.

Filed Jan. 13, 1977, Ser. No. 758,983
Int. Cl.² B21C *37/30;* B21D *53/28;* A01N *9/00*
U.S. Cl. 29—90 B 24 Claims



1. Apparatus for burnishing gears comprising: a pair of gear racks having opposed forming faces with teeth spaced therealong; drive means for moving the gears relative to each other; loading means that positions a toothed gear to be burnished for meshing with each rack during driven movement of the racks so that the meshing of the gear and rack teeth provides the sole support for the gears and concomitantly burnishes the gear teeth; and delivery means for receiving the burnished gear from the gear racks.

4,080,700

METHOD OF ATOMIZING A LIQUID, AN ATOMIZER TIP FOR USE IN THE METHOD AND METHOD OF MANUFACTURING THE TIP

William C. Muller, Harvard, Mass., assignor to Brunswick Corporation, Skokie, Ill.

Filed Jan. 5, 1976, Ser. No. 646,533
Int. Cl.² B23P *15/16, 17/00*
U.S. Cl. 29—157 C 11 Claims

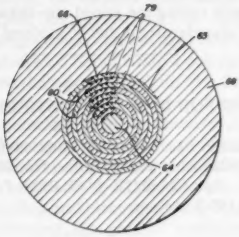
1. A method of forming an atomizer tip having triangular conduits comprising the steps of:

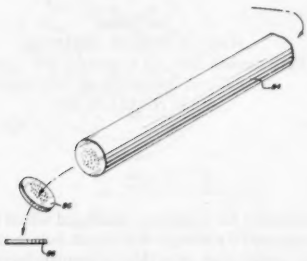
(a) providing a plurality of progressively different diameter tubular elements;

(b) forming a plurality of V-shaped grooves in the outer surface of the elements;

(c) telescopically assembling the elements, the elements being concentrically arranged and tightly packed and having an onion style cross-section;

(d) filling the grooves tightly with non-porous sacrificial filler material;
(e) forming a billet by placing said tubular elements with said filled grooves in an external enclosure concentrically and tightly packed;





(f) preventing distortion of the elements and filler material during subsequent reduction thereof by insuring that the billet is void free and tightly packed;
(g) transversely reducing the billet including the filler material until the filled grooves have a preselected small size;
(h) sectioning the reduced billet into a plurality of discs; and
(i) removing the filler material from said discs.

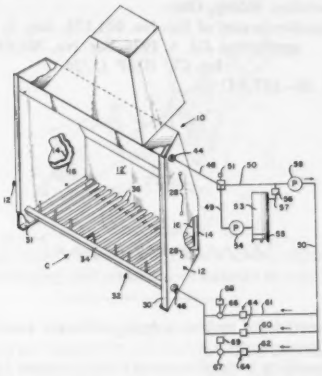
4,080,701

WATER JACKET FABRICATION

Clarence W. Cleer, Jr., Kane, Pa., assignor to Ridgway Steel Fabricators, Inc., Ridgway, Pa.

Continuation-in-part of Ser. No. 687,631, May 18, 1976, Pat. No. 4,025,043, which is a continuation-in-part of Ser. No. 495,107, Aug. 5, 1974, Pat. No. 3,958,755. This application Mar. 31, 1977, Ser. No. 783,311
Int. Cl.[2] B23P *15/26*
U.S. Cl. 29—157.3 D **7 Claims**

1. A method of fabricating a water jacket having spaced-apart walls utilizing a punch and an orificed support cooperating with the punch comprising the steps of:
(a) disposing a first metal plate generally horizontally on said orificed support,
(b) bringing said punch into operative engagement with said first metal plate to punch a hole in said plate and simultaneously deform the area surrounding said hole so that the plane of said hole is spaced a given distance S from the plane of said plate,
(c) disposing said first plate on a second plate so that said plates are generally parallel and so that the area surrounding said hole in said first plate abuts said second plate,
(d) joining said first plate to said second plate so that said plates are spaced apart a distance S by welding the area defining the hole in said first plate to the portion of said second plate visible through said hole in said first plate,
(e) forming said first and second welded together metal plates into a water jacket for surrounding an open-hearth wood-burning fireplace adapted to have an open fire therein, and
(f) forming a water inlet to said water jacket and a water



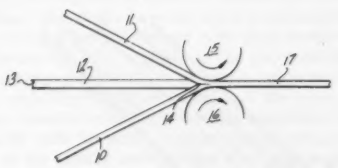
outlet from s d water jacket to provide for circulation of water aroun: a fire burning in said fireplace, including circulating water between said first and second metal plates.

4,080,702

METHOD FOR OBTAINING HOLLOW ARTICLES

Phillip A. Chatfield, West Haven, and Damian V. Gullotti, Cheshire, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Mar. 16, 1977, Ser. No. 778,040
Int. Cl.[2] B21D *26/02*
U.S. Cl. 29—157.3 V **9 Claims**

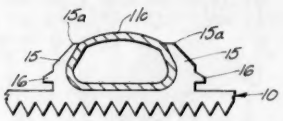


1. A method for the manufacture of hollow articles useful as heat exchangers which comprises: providing a first and second sheet of metal in superposed relationship; forming an assembly by placing at least one metal tube between said first and second sheets corresponding to a predetermined configuration of fluid passageways, said tube having a weld inhibiting material therein; pressure welding said assembly in the areas thereof not separated by weld inhibiting material; and expanding said assembly in the areas thereof separated by weld inhibiting material by the introduction of fluid pressure therein, wherein said first sheet, second sheet and tube have a leading edge and a trailing edge with the trailing edge of said tube being clamped shut during said expansion step, wherein weld inhibiting material is placed between said first and second sheets at the leading edge thereof with said sheets being peeled back after said pressure welding step to expose said tube.

4,080,703
RADIATING OR ABSORBING HEAT EXCHANGE PANEL

Edward G. Beck, Jr., Fort Thomas, Ky., assignor to The Stolle Corporation, Sidney, Ohio

Continuation-in-part of Ser. No. 601,174, Aug. 1, 1975. This application Jul. 6, 1976, Ser. No. 702,939
Int. Cl.[2] B23P *15/26*
U.S. Cl. 29—157.3 C 9 Claims

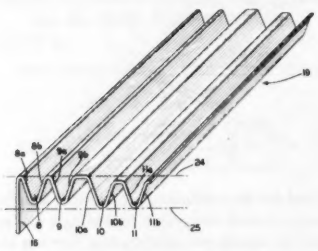


1. A method of making a heat exchanger panel, which includes the steps of:
(a) providing a metallic panel having on one face a pair of parallel, spaced, longitudinally extending retainer legs, said legs having angularly inwardly extending flanges,
(b) placing a metallic tube of circular cross section in the channel between said retainer legs,
(c) deforming said tube by squashing it by means of a die to cause said tube to be distorted into an oval shape which is confined within the area of said panel, retainer legs and flanges, and extending between the ends of said flanges, thereby reducing the internal cross sectional area of said tube, and
(d) holding said tube in its squashed relation to said channel, while subjecting the interior of said tube to sufficient pressure to expand it into intimate contact with the panel, retainer legs and flanges.

4,080,704
CIRCULAR FORM PROCESS FOR PULLEYS

Roland F. Blakesley, Novelty, Ohio, assignor to Blakesley Pulley Corporation, Cleveland, Ohio

Filed Jan. 26, 1977, Ser. No. 762,488
Int. Cl.[2] B21K *1/42*
U.S. Cl. 29—159 R 14 Claims

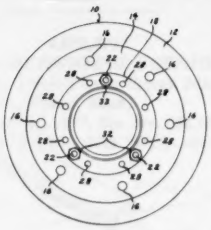


1. In a method of making a generally cup-shaped multi-V-grooved sheet metal pulley of the type having a bottom flange wall and an integrally connected outer generally cylindrical side wall having a plurality of V-grooves formed therein, from a flat sheet metal strip, including the steps of:
(a) feeding a strip of flat sheet metal from a strip supply;
(b) forming in the moving feed strip a plurality of generally V-shaped longitudinally extending, transversely spaced grooves in a first portion of the strip, and a bottom wall forming flange in a second portion of said strip located laterally of the first portion;
(c) rolling the formed strip into an annular cup-shaped split pulley blank with the strip ends located adjacent each other to reform the grooved portion of the strip into an annular cup side wall and to reform the bottom wall forming flange into a cup bottom wall extending transversely of the axis of the side wall at one end of the annular side wall;
(d) joining together the adjacent ends of the reformed cup-shaped split pulley blank; and
(e) then finish rolling the joined cup-shaped pulley blank to remove irregularities in the V-grooved pulley side wall.

4,080,705
METHOD FOR REPAIRING WHEEL HUBS FOR VEHICLES

Ronald G. Bailey, Rte. 3, Box 81, Jacksonville, Ark. 72076

Filed May 26, 1977, Ser. No. 800,987
Int. Cl.[2] B21K *1/40;* B23P *7/00*
U.S. Cl. 29—159.3 1 Claim

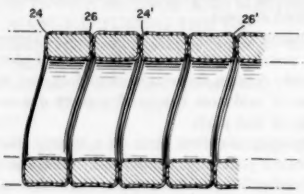


1. The method for repairing a damaged wheel hub having at least one excessively elongated stub bolt hole in the axle engaging flange, comprising: providing a template having a plurality of first holes positioned to match the stud bolt holes on the flange and a plurality of second holes equally spaced between pairs of said first holes; placing the template on the flange with flange stud bolts passing through at least two of said second holes in the template; securing the template to the flange with the first holes on the template equally spaced between pairs of stud bolt holes; drilling a plurality of additional holes in the hub flange with each of the first holes in the template used as a guide; removing the template from the hub; tapping the new stud bolt holes; installing axle engaging studs in said new holes in the hub.

4,080,706
METHOD OF MANUFACTURING CATHETER GUIDEWIRE

Marlin S. Heilman, Gibsonia, and Seid W. Waddell, Tarentum, both of Pa., assignors to Medrad, Inc., Pittsburgh, Pa.

Division of Ser. No. 570,999, Apr. 22, 1975, Pat. No. 4,003,369. This application Nov. 4, 1976, Ser. No. 739,016
Int. Cl.[2] B21F *35/00;* B23P *13/00*
U.S. Cl. 29—173 11 Claims



1. A method of manufacturing a guidewire adapted to guide a catheter into a patient, the method comprising the steps of: forming an elongated rectangular flatwire having a width dimension and a height dimension less than said width dimen-

sion; coating the surface of said elongated flatwire with a layer of a coating material; and subsequently winding the coated elongated flatwire into a substantially cylindrical coil spring wherein the surface of said guidewire is defined by consecutive coils of contacting widths.

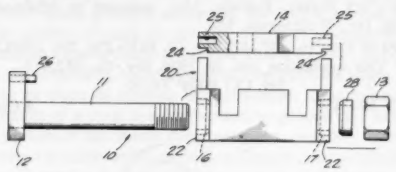
6. A method of manufacturing a guidewire ready to guide a catheter into a patient, the method comprising the steps of: forming an elongated rectangular flatwire having a width dimension and a height dimension less than said width dimension; coiling said elongated flatwire into a coil spring having a configuration substantially as desired for the finished guidewire, wherein the surface of said guidewire is defined by consecutive coils of contacting widths; grinding the entire outer surface of said coil spring to remove gross irregularities therefrom, and electropolishing at least the entire surface of said coil spring to remove substantially all microscopic irregularities therefrom; said grinding and electropolishing steps being performed without affecting the general configuration of the coiled flatwire.

4,080,707

BUSHING SERVICE TOOL

Roger J. Mabry, 772 Teakwood La., San Dimas, Calif. 91773

Filed Apr. 20, 1977, Ser. No. 789,021
Int. Cl.[2] B23P *19/04*
U.S. Cl. 29—263 **4 Claims**



1. A bushing service tool for use in substituting one or more of a plurality of aligned bushings without risk of distoring the environmental support structure for said bushings comprising: elongated threaded bolt means extendable loosely through a plurality of said aligned bushings, said bolt means being adapted to support a new bushing thereon with one end in contact with a worn bushing to be displaced by said new bushing, a nut for said bolt means operable while being tightened to replace a worn bushing with a new bushing, and rigid strut means insertable between adjacent sides of said support structure closely beside the bushing seating openings thereof while said bushings are being serviced and effective to prevent damage to said support structure while said nut is being tightened along said bolt means.

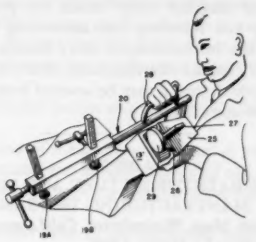
4,080,708

METHOD OF REPAIRING A DREDGE CUTTERHEAD

Albert Alphonse Decombe, Ste Foy les Lyon, and Gerard Alexandre Zanini, St-Priest, both of France, assignors to ESCO Corporation, Portland, Oreg.

Filed Dec. 10, 1976, Ser. No. 749,291
Int. Cl.[2] B23P *7/00*
U.S. Cl. 29—401 F **4 Claims**

1. A method of repairing a dredge cutterhead wherein said head has a plurality of teeth disposed thereon at different locations and different angles, each tooth including an adapter fixed to said head and a point removably mounted on said adapter, characterized by the fact of equipping said head at the time of manufacture thereof with at least two position openings for each tooth, removing a worn adapter, providing a fixture adapted to support a replacement adapter and having adjustable spindles adapted to be inserted into said openings, adjusting said spindles to predetermined extensions, supporting replacement adapter on said fixture, inserting said spindles into



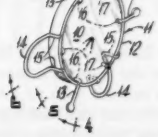
said openings and orienting said fixture to a predetermined angle, and attaching said replacement adapter to said head.

4,080,709

METHOD OF MAKING AN INTRA-OCULAR LENS

Stanley Poler, 78 E. Second St., New York, N.Y. 10003

Continuation-in-part of Ser. No. 691,033, May 28, 1976. This application Mar. 23, 1977, Ser. No. 780,682
Int. Cl.[2] B23P *17/00*; A61F *1/16, 1/24*
U.S. Cl. 29—412 **15 Claims**



1. The method of making an intra-ocular lens mount, which comprises preparing to greatly enlarged scale of a drawing a unitary flat blank for the mount, said drawing being of configuration defining a ring-like body with radially inward barbs at angularly spaced locations and with radially outward feet at angularly spaced locations, photographically reducing said drawing to a negative of intended ultimate scale for the mount, selecting a thin sheet of a metal which is tolerated by the body and coating a surface thereof with photosensitive material, contact-exposing the negative to the photosensitive coating, and developing the same to a positive image upon the metal sheet, subjecting the developed side of the metal sheet to an etching chemical solution, whereby a completed blank results consistent with the positive image configuration, and bending some of the radially outward feet into axially offset relation with respect to others of the radially outward feet.

14. The method of making an intra-ocular lens, involving a lens element and an adapter mount for iris-stabilized implantation, which method comprises preparing to greatly enlarged scale of a drawing a unitary flat blank of the mount, said drawing being of configuration defining a ring-like body with radially outward feet at angularly spaced locations, photographically reducing said drawing to a negative of intended ultimate scale for the mount, selecting a thin sheet of an etchable material which is tolerated by the body and coating a surface thereof with photosensitive material, contact-exposing the negative to the photosensitive coating, developing the same to a positive image upon the sheet, subjecting the developed side of the sheet to an etching chemical solution, whereby a completed ring-like blank results consistent with the positive image configuration, said negative being one of a plurality of adjacent duplicate negatives of the same photographically reduced drawing, said negatives being in side-by-side adjacency on a

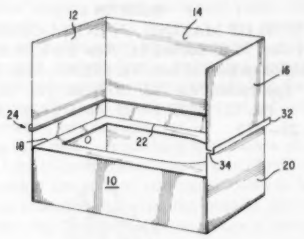
single sheet, with at least one of the feet of adjacent negatives interconnected, said sheet of etchable material being contact-exposed to said single sheet of plural negatives, whereby plural interconnected ring-like body blanks are produced by the etching step, and selecting and assembling individual lens elements to the interconnected body blanks, whereby lens assemblies may remain interconnected until one such assembly is needed at which time it may be severed from its connection to an adjacent assembly.

4,080,710

MOLDED BATHTUB FIXTURE AND METHOD OF MANUFACTURING THE SAME

Stephen Walter Hess, Westminster, Calif., assignor to Hessco Industries, Inc., La Habra, Calif.

Filed May 16, 1977, Ser. No. 796,851
Int. Cl.[2] B29C *5/02;* B29D *3/02*
U.S. Cl. 29—416 **7 Claims**



1. The method for forming a molded bathtub and associated wall extending above the bathtub, comprising:

molding a plastics bathtub with an integral wall extending above a rim of the tub and forming in said wall an outwardly extending bulge having three connected wall portions along a length of the wall;

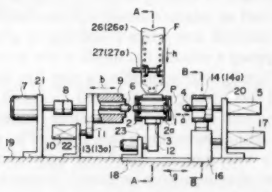
severing said wall along its length in the vicinity of the bulge to form mating upper and lower flanges, from said wall portions, which can be interfitted together to form said bathtub with said associated wall extending above the bathtub.

4,080,711

METHOD AND APPARATUS FOR ROLL PACKING A FILM STRIP

Ken Kawada, and Shigemitsu Mizutani, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Mar. 22, 1977, Ser. No. 780,157
Claims priority, application Japan, Mar. 24, 1976, 51-32347
Int. Cl.[2] B65B *25/00, 43/00;* B23P *19/04*
U.S. Cl. 29—427 **9 Claims**



1. A method of roll loading a precut strip of photographic film into a preassembled film cartridge including a slotted spool having means therein for engaging an end of the film strip, a slotted, cylindrical shell disposed concentrically around the spool, and a pair of opposite end caps disposed over the spool ends and engaging the ends of the shell, characterized by the steps of:

a. delivering a cartridge to a predetermined position at a work station,

b. axially gripping the ends of the spool to hold same at said position,

c. squeeze engaging the shell to release the end caps therefrom,

d. axially moving the shell relative to the spool to separate a released end cap from the shell and expose the spool,

e. aligning the spool slot with the film strip,

f. inserting an end of the film strip into the aligned slot and into engagement with the engaging means,

g. rotating the spool to wind the film thereof until just a leader portion end thereof remains exposed,

h. axially moving the shell and unseparated end cap relative to the spool to effect the reassembly thereof in such a manner that the leader portion end extends through and protrudes from the shell slot,

i. releasing the shell and reengaging the end caps therewith, and

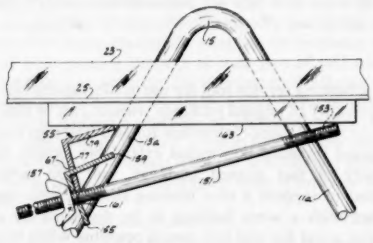
j. removing the loaded cartridge from the work station.

4,080,712

METHOD OF ERECTING FORMWORK SYSTEM

Adolph Carl Weber, Ballwin, Mo., assignor to Midwestern Joists, Inc., Washington, Mo.

Division of Ser. No. 508,545, Sep. 23, 1974, Pat. No. 3,948,503.
This application Jan. 26, 1976, Ser. No. 652,077
Int. Cl.[2] B23P *19/00*
U.S. Cl. 29—458 **4 Claims**



1. The method of erecting formwork for pouring a slab in place on steel joists, each joist being in the form of a truss having a web, a top chord and a bottom chord, the web being formed of metal bar stock and comprising inclined tension and compression members triangulating the space between the top and bottom chords, the top chord comprising a pair of metal bars welded to opposite sides of the web, said method comprising

removably mounting form supports extending transversely of the joists through the webs of the joists underneath the top chords of the joists,

removably mounting on said form supports forms for the pouring of a slab with the forms extending underneath portions of the top chord bars,

said form supports being removably mounted on certain of said inclined tension and compression web members and held up between said inclined web members and the bottom of the top chord, and the form supports being removably held up between said inclined web members and the bottom of the top chord by removably interposing means for drawing said supports up the said inclined web members, said means extending between said supports and adjacent inclined web members.

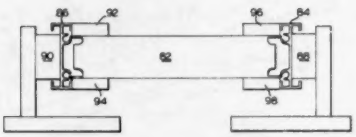
4,080,713
METHOD OF JOINING A LADDER RUNG TO A LADDER RAIL

Robert John Reid, 50 Transwell Ave., Willowdale, Ontario, Canada

Division of Ser. No. 504,178, Sep. 9, 1974, Pat. No. 3,970,400, which is a division of Ser. No. 377,786, Jul. 9, 1973, Pat. No. 3,854,185. This application Apr. 23, 1976, Ser. No. 679,703

Int. Cl.[2] B23K *31/02*

U.S. Cl. 29—469.5 **3 Claims**



1. A method of joining a ladder rung to a ladder rail where each end of said ladder rung is provided with outwardly extended flanges of essentially uniform thickness which are inserted into arcuate shaped spaced-apart grooves provided on inner surfaces of said ladder rails, pressure being applied to move said rails towards each other to thereby deform the flanges of the rung in the grooves of the rails to form at least a portion of coil of each flange in each groove, to thereby secure the rung to the rail; said method being characterized in providing two raised portions extending the length of and on the inside surface of each ladder rail where an elongate groove, arcuate in cross-section, is located in and extends along each said raised portion, each groove having opposed edges which define an elongate opening of a dimension to permit entry of the flange of a rung in a corresponding groove of a rail, each end portion of the ladder rung being cut away in a manner to provide two outwardly extending flanges, of essentially uniform thickness integral with the side walls of the ladder rung a stop portion being provided intermediate said flanges, the rung being recessed on each side of and back of said stop portion, positioning a plurality of so formed ladder rungs between two so formed ladder rails with the flanges of the rung ends being aligned with the corresponding grooves, so that each flange enters the groove along a path offset from the central axis of said groove and applying sufficient external force to said rails to move them towards each other to thereby deform said flanges within said grooves to form at least a portion of a coil of a flange in each groove, the width of the coiled portion being greater than the width of said elongate opening of the groove, said stop portion on each rung abuting the inner surfaces of said opposing rails to limit the extent to which the flanges are inserted into the corresponding grooves and to determine the distance between the ladder rails when secured to the ladder rungs, the recessed portions in each rung on each side of the stop portion accommodating a section of the raised portions on each ladder rail.

4,080,714
FLEXIBLE POLISHING DRUM SEGMENT AND METHOD OF MAKING AND MOUNTING SAME

Grahame W. Emerson, Culver City, Calif., assignor to Merit Abrasive Products, Inc., Compton, Calif.

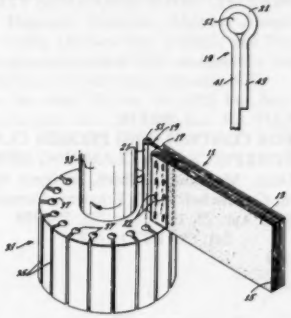
Filed Feb. 17, 1976, Ser. No. 658,840

Int. Cl.[2] B21D *39/00;* **B23P** *11/02*

U.S. Cl. 29—509 **15 Claims**

1. A flexible drum segment comprising
an abrasive packet including
a plurality of flaps of substantially identical size and shape joined together along one common edge thereof,
a root member comprising
a first, relatively long plate section,
means for fixing said packet to said first plate section,
a second, relatively short plate section extending parallel to and in surface-to-surface abutment with said first plate section, and
a root element integral with and extending between said first and second plate sections in a progressively sloping relationship, having no sharp bends, in successive positions on the root element and in the transition between the root element and the first and second plate sections, and
core means located within and substantially filling said root element.

12. In a method of maintaining an abrasive packet in fixed relation to a rotatable hub against centrifugal and tensile forces generated by the packet during rotation of the hub, comprising the steps of
providing a metal plate of predetermined height and length in accordance with the sizes of the hub and packet to be employed,



providing a rod-like element having a predetermined diameter and a particular axis at the center of the rod and a length substantially equal to the length of the plate,
bending the plate about the particular axis while
locating the rod-like element on the axis, thereby forming a first plate section having a relatively long length and a second plate section having a shorter length than the first section and located in substantially parallel, surface-to-surface abutment with the first plate section and further forming between the first and second plate sections a root section abutting the rod along the length of the rod and defining small angles between successive positions on the root element and between successive positions in the transition between the root element and each of the first and second plate sections and thereby also
causing the rod-like element to be gripped by the wall of the root section about the axis while limiting the bend angles occurring between the root section and the first and second plate sections.

4,080,715
PROCESS FOR PRODUCTION OF LAMELLAR GRAPHITE-CONTAINING MATERIAL

Chisato Yoshida, Akashi, and Takasuke Mori, Ashiya, both of Japan, assignors to Kobe Steel, Ltd., Kobe, Japan

Filed Mar. 16, 1977, Ser. No. 778,112

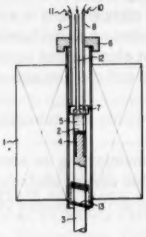
Claims priority, application Japan, Mar. 16, 1976, 51-29004

Int. Cl.[2] C21D *5/14;* **C22F** *1/10;* **C21D** *7/14*

U.S. Cl. 29—527.7 **9 Claims**

1. A process for preparing a lamellar graphite-containing material from an iron based or nickel based alloy containing 2 to 5% carbon, which comprises:
a. unidirectionally solidifying said iron based or nickel based

alloy at a solidification rate not greater than 10 mm/hr. and



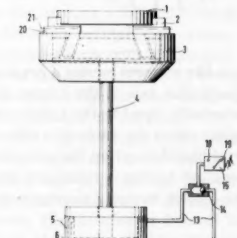
b. subjecting the solidified alloy to hot plastic deformation processing in a direction parallel to the solidification direction.

4,080,716

METHOD FOR CONTROLLING PROPER CLAMPING OF A WORKPIECE IN A CLAMPING DEVICE

Heinz vom Dorp, Monchen-Gladbach, assignor to Wilhelm Hegenscheidt Gesellschaft mbH, Erkelenz, Germany

Filed Apr. 25, 1977, Ser. No. 790,299
Int. Cl.[2] B23Q *3/08*
U.S. Cl. 29—559 **6 Claims**



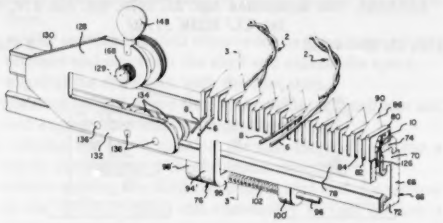
1. A method for controlling proper clamping of a workpiece in a clamping device having clamping jaws operatively connected to fluid operated cylinder-and-piston means, the piston of which is to be moved in one direction during clamping of the workpiece, comprising the steps of placing a workpiece between the open clamping jaws; feeding pressure fluid into said cylinder-and-piston means to move the piston thereof in said one direction; sensing whether the piston during movement in said one direction reaches at least one first piston position but not a second piston position spaced in said one direction from said first position; simultaneously sensing the presence of a predetermined fluid pressure acting on the piston; and producing a control signal indicating proper clamping of the workpiece when the piston in its final clamping position has at least reached said first position but not reached said second position while said predetermined fluid pressure is present in said clamping position.

4,080,717

TELEPHONE CABLE SPLICING APPARATUS

Edward Dennman Bunnell, Palm Harbor, Fla., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Jul. 23, 1976, Ser. No. 707,981
Int. Cl.[2] H01R *43/04*
U.S. Cl. 29—566.4 **15 Claims**



1. Apparatus for inserting wires into the plate-like wire-receiving portions of electrical contact terminals, said wire-receiving portions extending from a planar surface of a connecting device, said wire-receiving portions being arranged in side-by-side co-planar relationship in a row, said apparatus comprising:

connecting device supporting means for supporting said connecting device in a predetermined orientation,

a wire inserter for moving said wires laterally of their axes and into said wire-receiving portions of said terminals,

guide means for guiding said inserter along a wire inserter working stroke path which extends parallel to, and across, said planar surface of a connecting device on said connecting device supporting means and parallel to said row of wire-receiving portions,

said wire inserter having smooth continuous surface portions which move across said planar surface during movement of said inserter along said path, said inserter having a continuous slot extending into said surface portions, said slot being dimensioned to receive and provide clearance for said wire-receiving portions of said terminals during movement of said inserter along said working stroke path whereby,

upon locating said wires in side-by-side spaced apart relationship with the axes of said wires extending across said row and with said wires in alignment with said wire-receiving portions, and upon movement of said inserter along said path, said wires are successively pushed into said wire-receiving portions of said terminals by said surface portions of said inserter.

4,080,718

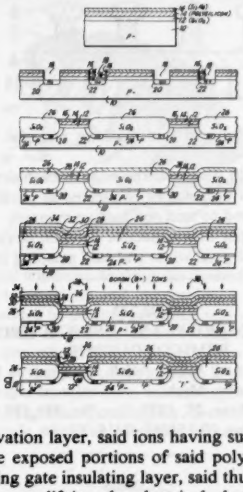
METHOD OF MODIFYING ELECTRICAL CHARACTERISTICS OF MOS DEVICES USING ION IMPLANTATION

Paul Richman, St. James, N.Y., assignor to SMC Standard Microsystems Corporation, Hauppauge, N.Y.

Filed Dec. 14, 1976, Ser. No. 750,368
Int. Cl.[2] H01L *21/96*
U.S. Cl. 29—571 **15 Claims**

1. A process for fabricating an MOS semiconductor circuit which comprises the steps of providing a substrate of a first conductivity type, forming spaced regions of an opposite conductivity type in a surface of said substrate, a channel region being defined between adjacent pairs of said regions which define the source and drain regions of a plurality of field-effect transistors; forming a thin gate insulating layer overlying said channel regions; forming a doped polysilicon gate electrode layer overlying said gate insulating layer at each of said channel regions; forming a passivation layer over said polysilicon gate electrode layer, thereby forming a completed semiconductor structure with said overlying passivation layer constituting a protective layer for said structure, thereby allowing the structure to be stored in this form, all of said transistors at

this stage in the process having similar electrical characteristics; subsequently modifying the electrical characteristics of selected ones of said transistors by selectively forming openings in said passivation layer overlying selected ones of said channel regions, thereby exposing portions of the underlying polysilicon layer; thereafter, utilizing the remaining portion of said passivation layer as an implantation barrier, implanting ions through said openings formed by the removal of portions



of said passivation layer, said ions having sufficient energy to penetrate the exposed portions of said polysilicon layer and said underlying gate insulating layer, said thus formed implantation regions modifying the electrical characteristic at said selected ones of said transistors to a second, different electrical characteristic; and retaining thereafter the remaining portion of said passivation layer to provide continuing mechanical protection for the thus modified structure.

4,080,719

METHOD OF MANUFACTURING A SEMICONDUCTOR DEVICE AND DEVICE MANUFACTURED ACCORDING TO THE METHOD

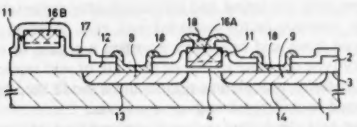
Hermanus Josephus H. Wilting, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 9, 1976, Ser. No. 721,661

Claims priority, application Netherlands, Sep. 17, 1975, 7510903

Int. Cl.² B01J *17/00*

U.S. Cl. 29—571 **14 Claims**



1. A method of manufacturing a semiconductor device, comprising the steps of:

(a) providing a semiconductor body comprising a surface,

(b) providing an electrically insulating layer on said surface,

(c) providing on said insulating layer a silicon layer which is to be given a desired pattern,

(d) providing on said silicon layer a masking layer that corresponds to said pattern and provides to said silicon layer local protection against removal of a portion thereof and against oxidation,

(e) removing those parts of said silicon layer not present below said masking layer,

(f) providing said semiconductor surface with at least two electrode zones by providing material in said semiconductor body while using at least a part of said silicon pattern as a mask,

(g) subjecting at least the exposed edges of the resulting silicon pattern to an oxidation treatment,

(h) selectively removing said masking layer to expose only the upper surface of said silicon pattern,

(i) providing a metal on said silicon pattern surface,

(j) subjecting the assembly thus produced to a temperature treatment, whereby at least a part of the silicon pattern is converted into a metal silicide by reaction with the metal, and

(k) then removing the non-converted said metal.

4,080,720

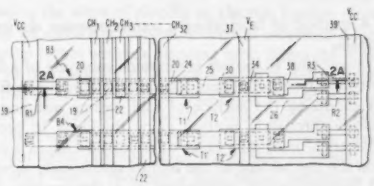
HIGH DENSITY SEMICONDUCTOR CIRCUIT LAYOUT

John Balyoz, Hopewell Junction; Algirdas Joseph Gruodis, Wappingers Falls; Teh-Sen Jen, Fishkill, and Wadie Faltas Mikhail, Poughkeepsie, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 644,775, Dec. 29, 1975, Pat. No. 4,032,962. This application Dec. 27, 1976, Ser. No. 754,704

Int. Cl.² H01L *29/72*

U.S. Cl. 29—577 C **17 Claims**



1. In the method of fabricating a semiconductor substrate layout which includes columnar arrays of circuits having substantially identical geometric form disposed within said substrate, the improvement wherein each of said circuits is formed by the steps of:

forming a first device including an elongated impurity region and a set of other impurity regions formed within said elongated region and a second device located adjacent the narrow side of said first device;

said elongated region being sufficiently large so as to be capable of containing a predetermined maximum number of said other impurity regions;

forming selectively a first insulating layer above said substrate so as to expose both selected ones of said set of other impurity regions as well as an impurity region of said second device in said array;

forming interconnecting means to the surface of said first insulating layer from said selected ones of said other impurity regions; the number of said other impurity regions so interconnected in each said circuit being less than said predetermined maximum number;

forming a first set of conductors in each column extending over said elongated regions of said circuits orthogonally with respect to the elongated direction on said first insulating layer so as to connect certain ones of said set of conductors to said interconnected other impurity regions;

forming a second insulating layer above said first insulating layer so as to expose said impurity regions of said second devices.

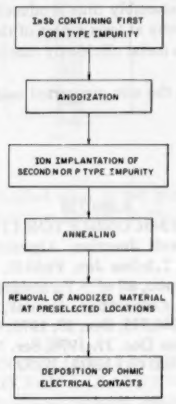
forming a second set of conductors on said second insulating layer, thereby interconnecting said second set of conductors with said impurity regions of said second devices;

said second set of conductors extending substantially parallel to said elongated direction.

4,080,721
FABRICATION OF SEMICONDUCTOR DEVICE

Roland Y. Hung, Somers, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 30, 1975, Ser. No. 591,996
Int. Cl.[2] B01J *17/00*
U.S. Cl. 29—578 14 Claims


InSb CONTAINING FIRST P OR N TYPE IMPURITY
ANODIZATION
ION IMPLANTATION OF SECOND N OR P TYPE IMPURITY
ANNEALING
REMOVAL OF ANODIZED MATERIAL AT PRESELECTED LOCATIONS
DEPOSITION OF OHMIC ELECTRICAL CONTACTS

1. A method of fabricating a semiconductor device which comprises:

(A) providing an indium antimonide substrate of a first conductive type containing an active impurity of a first type;

(B) anodizing the surface of said indium antimonide substrate through a portion of its thickness to provide an electrical insulating layer of anodized indium antimonide on the top surface of the indium antimonide substrate;

(C) selectively ion implanting at a temperature between about −200° C and about 100° C active impurity of a second type into at least one preselected region of the indium antimonide substrate;

(D) annealing at a temperature between about 200° C and about 300° C subsequent to ion implanting whereby the annealing temperature is higher than the ion implantation temperature for about 15 minutes to about 120 minutes;

(E) removing the anodized material at preselected locations on the insulating layer to provide for ohmic electrical contact between preselected regions of the underlying indium antimonide substrate, and subsequently applied electrical contacts, which preselected regions include said at least one region which contains the ion implanted impurity of the second type; and

(F) depositing a plurality of electrical contacts at preselected locations, a predetermined number of which is in ohmic electrical contact with said at least one preselected region of said substrate which contains the ion implanted impurities of the second type to provide said semiconductor device.

4,080,722
METHOD OF MANUFACTURING SEMICONDUCTOR DEVICES HAVING A COPPER HEAT CAPACITOR AND/OR COPPER HEAT SINK

Jerome Barnard Klatskin, Princeton Junction, and Arye Rosen, Cherry Hill, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Mar. 22, 1976, Ser. No. 668,906
Int. Cl.[2] B01J *17/00*
U.S. Cl. 29—580 11 Claims

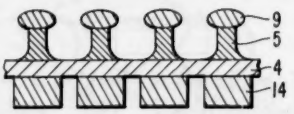
1. A method of manufacturing semiconductor devices having a copper heat capacitor which comprises:

a. depositing a metal film on both sides of an appropriately doped semiconductor wafer;

b. depositing a conductive support layer on said metal film on one side of said semiconductor wafer;

c. etching said semiconductor wafer to form a plurality of semiconductor devices on said conductive support;

d. applying a masking material over the devices on said conductive support;



e. opening windows in said masking material above each device;

f. attaching a gold wire near the edge of each device, so that each device is electrically connected in parallel to all of said devices and to said conductive support;

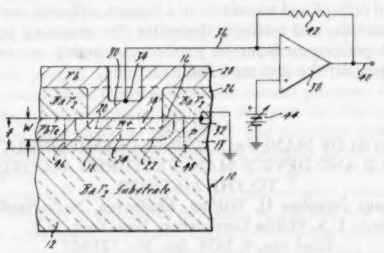
g. plating a copper heat capacitor on each device, and

h. removing said gold wires and said masking material.

4,080,723
METHOD FOR MAKING AND USING A GROUP IV-VI SEMICONDUCTOR

Henry Holloway, Ann Arbor, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Mar. 25, 1977, Ser. No. 781,377
Int. Cl.[2] H01L *7/18, 27/14*
U.S. Cl. 29—584 8 Claims



1. A method for making and using a group IV–VI photovoltaic semiconductor diode comprising the steps of:

applying, to a substrate of an insulating material, a thin film of a group IV-VI semiconductor material of *p* type or *n* type conductivity, a boundary thereby being formed between said insulating and semiconductor materials;

in said semiconductor material and at a location therein spaced from said boundary, forming a region of conductivity type opposite to that of the bulk of said semiconductor material, a depletion region and a diode thereby being formed in said semiconductor material;

causing said depletion region to extend to said boundary, thereby, to reduce substantially the capacitance of said diode relative to the capacitance said diode would have were said depletion region not to extend to said boundary.

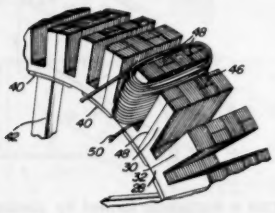
4,080,724
METHOD OF FORMING ELECTRICAL MACHINE CARE FROM E-LAMINATIONS

Willard D. Gillette, Brunswick, Me., assignor to Zephyr Wind Dynamo Company, Brunswick, Me.

Filed Jan. 13, 1976, Ser. No. 648,815
Int. Cl.[2] H02K *15/02*
U.S. Cl. 29—598 6 Claims

1. The method of forming an annular core for an electrical machine component consisting of the steps of stacking a plural-

ity of plate-like E-laminations in aligned relation with each lamination including a web and three legs perpendicular to one edge thereof and opposed parallel flat side surfaces, bending the E-laminations by exerting force on the outer legs while maintaining pressure on the flat surfaces thereof to prevent lateral deflection and deforming the web into arcuate configuration conforming to the curvature of the core being formed, rigidly securing a plurality of the bent and deformed stacks of E-laminations in end-to-end relation to form an annular core,



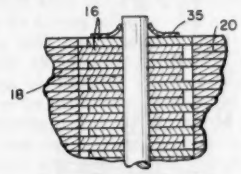
assembling coil windings on the poles formed by the legs of the assembled E-laminations, and encapsulating the coil windings and E-laminations in potting material, said step of rigidly securing the stacks of E-laminations in end-to-end relation including the step of welding backing plates interiorly of the curved edges of the webs of the stacked E-laminations thereby providing a rigid annular core, assembling a central hub with spokes extending therefrom rigidly secured to the backing plates to provide a bearing support for the core.

4,080,725

FERROMAGNETIC CORE WITH VARIABLE SHUNT AIR GAP AND METHOD OF MAKING IT

Edward R. Cronk, Indianapolis, Ind., assignor to Thomas & Skinner, Inc., Indianapolis, Ind.

Division of Ser. No. 483,310, Jun. 26, 1974, abandoned. This application Jan. 21, 1977, Ser. No. 761,416
Int. Cl.[2] H01F *41/02*
U.S. Cl. 29—609 **10 Claims**



1. The method of making a magnetic core structure which includes a shunt having an effective air gap which is variable in assembly to produce different selected values, which comprises

starting with flat shunt laminations of a length to provide a predetermined maximum air gap length, and with each lamination having an alignment hole adjacent the midpoint thereof but offset from such mid-point in the direction of flux flow therein by an amount not exceeding one-half said maximum air gap length,

assembling a shunt leg by stacking said flat shunt laminations on an aligning guide with such guide extending through the alignment holes of the successive laminations to align said holes,

and orienting the laminations in the stack in a staggered pattern in which successive groups of one or more laminations are oriented with their long ends in opposite directions,

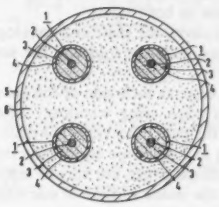
and selecting the proportion of laminations oriented in each direction in the stack so that the number of laminations oriented in one direction is substantially not more than half the number oriented in the other direction, so as to provide an effective air gap intermediate that provided by orienting all the laminations in one direction and that provided by orienting generally equivalent numbers of laminations in opposite directions.

4,080,726

METHOD FOR MANUFACTURING AN ELECTRICAL HEATING DEVICE

Nikolaus Neimanns, Salmunster, and Manfred Krupka, Wachtersbach, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Feb. 23, 1977, Ser. No. 771,383
Int. Cl.[2] H01C *17/02, 1/02*
U.S. Cl. 29—611 **8 Claims**



1. In a method for manufacturing an electrical heating device including the steps of placing an electric heating element comprising an electrical resistor, electrical insulaton material and a metallic jacket within a cladding tube, filling the remaining space in the cladding tube with a metal powder having a high thermal conductivity, first densifying the powder after the powder is placed in the cladding tube, and subsequently sintering the powder, the improvement comprising the steps of

mixing said metal powder, prior to said step of filling, from grain sizes which produce a high filling density in said cladding tube,

additionally densifying said metal powder, subsequent to said step of first densifying but prior to said step of sintering, by reducing the diameter of said cladding tube, and

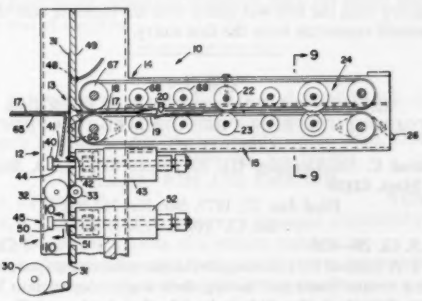
further reducing the diameter of said cladding tube to compensate for shrinkage of said metal powder during said step of sinterng.

4,080,727

BATTERY PLATE ENVELOPE MACHINE AND METHOD OF MAKING BATTERY PLATE ENVELOPES

William H. Stoile, Belmont, and Ralph G. Tiegel, San Carlos, both of Calif., assignors to Tiegel Manufacturing Company, Belmont, Calif.

Filed Apr. 18, 1977, Ser. No. 788,335
Int. Cl.[2] H01M *2/14*
U.S. Cl. 29—623.4 **18 Claims**



1. A method for assembling a battery plate separator envelope onto a battery plate, comprising:

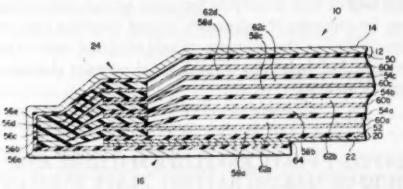
feeding a sheet of separator material of a width greater than that of a battery plate, from a supply roll toward a folding station;
scoring a folding line across the sheet, perpendicular to the length of the sheet;
punching out a notch in each edge of the sheet at the ends of the folding line;
positioning the sheet in the folding station;
cutting the sheet from the roll such that the folding line is at the approximate center of the sheet;
pushing a battery plate with its bottom edge forward into the sheet against the folding line until the plate and the sheet are engaged between opposed conveyors supported on rollers adjacent to the folding station, thereby folding the sheet into an envelope about the plate with edges overlapping the plate on both sides;
continuing to convey the plate and envelope away from the folding station with the fold and the notched edges forward;
spreading one edge at each side of the envelope away from the adjacent edge using stationary lifters positioned at each side of the path of travel of the plate and envelope, so that notches and envelope edges pass the lifters;
while the envelope edges are spread, applying a hot melt adhesive to the inside surface of one edge at each side of the envelope; and
compressing the adjacent edges together at each side of the envelope before the adhesive has set, thereby sealing the envelope at both sides.

4,080,728

METHOD OF MAKING FLAT BATTERY

Sheldon A. Buckler, Lincoln, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 495,681, Aug. 8, 1974, abandoned. This application Nov. 24, 1976, Ser. No. 744,872
Int. Cl.[2] H01M *10/04*
U.S. Cl. 29—623.4 **11 Claims**



1. In a method of making batteries with slurry electrodes, the steps of sealing a conductive plastic intercell connector over a central opening in a thermoplastic frame, depositing a first wet electrode slurry over the intercell connector in the opening in the frame, covering the first wet slurry with a sheet of separator material, and depositing a second wet electrode slurry in registry with the first wet slurry over the opposite side of the intercell connector form the first slurry.

4,080,729

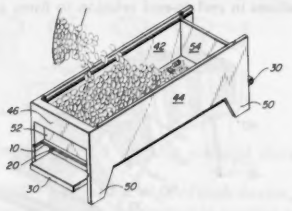
METHOD FOR TRANSFERRING ELECTRICAL COMPONENTS FROM A BREADBOARD TO A PRINTED CIRCUIT BOARD

Alfred C. Mecklenburg, III, 93 Beacon St., Apt. 8, Boston, Mass. 02108

Filed Jan. 27, 1977, Ser. No. 763,062
Int. Cl.[2] H05K *3/30*
U.S. Cl. 29—626 **6 Claims**

1. A method for retaining electronic components positioned on a circuit board and having their leads inserted into holes extending through said board while their leads are affixed to the board, comprising:
a. utilizing said circuit board as one side of a container;
b. introducing particles into said container in a sufficient quantity to surround and cover the components;
c. enclosing said container in a manner sufficient to insure that said particles hold the components in position on said board; and,
d. affixing the leads of said components to said circuit board.

4. Apparatus useful for facilitating transfer of electronical



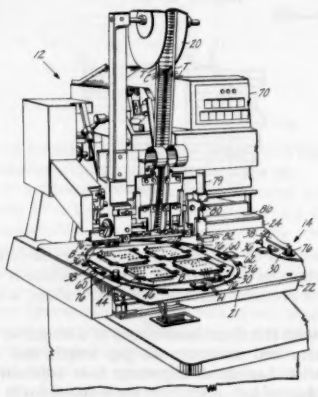
components from a composite formed by placing a printed circuit board into contacting and aligned relationship with a breadboard and inserting component leads therethrough, comprising:
a. a frame for a container having at least two open sides;
b. means for engaging said composite as one side of said container; and,
c. means for enclosing the other open side of said container.

4,080,730

MACHINE FOR ASSEMBLING COMPONENTS

Daniel Wayne Woodman, Jr., Beverly, Mass., assignor to USM Corporation, Boston, Mass.

Filed Sep. 7, 1976, Ser. No. 721,071
Int. Cl.[2] H05K *3/30*
U.S. Cl. 29—701 **16 Claims**

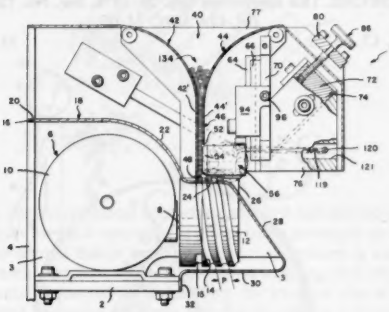


1. In a machine for assembling articles in predetermined angular relation on a workpiece, a carriage movable in an X-Y plane, a work support mounted on the carriage for movement about a Z-axis, means movable toward and from the work support for applying articles to the workpiece carried by the support, power means for controlling programmed X-Y movements of the carriage and said support, a pivot projection extending from the support, and means associated with the machine and cooperative with the projection in response to the programmed X-Y movement of the carriage and support for automatically rotating the latter a predetermined angle about its Z-axis.

4,080,731
APPARATUS FOR SINGLING OUT AND SERIALLY FEEDING ELECTRICAL LEADS

James Woodrow Hammond, Camp Hill, and Mervin Leonard Shughart, Carlisle, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Division of Ser. No. 628,028, Nov. 3, 1975, abandoned. This application Nov. 17, 1976, Ser. No. 742,719
Int. Cl.[2] H01R *43/04*
U.S. Cl. 29—715 19 Claims



1. A wire feeding and electrical contact applicator mechanism, comprising:

a barrier provided with a wire receiving opening of sufficiently small dimensions to prevent insertion of a human operator's finger therethrough,

a friction drive,

a pair of jaws of an applicator mounted in tandem alignment with said friction drive,

said jaws being normally spaced apart and closeable together for cold forging an electrical contact to an electrical wire transported between said jaws by said friction drive,

said friction drive including a cylindrical feed roller and a motor for driving said feed roller and an idler roller cooperating with said feed roller to frictionally grip there between an electrical wire supplied by an operator through said electrical wire receiving opening,

means on the cylindrical periphery of said feed roller for transporting a wire transversely of its length from said wire receiving opening toward said jaws and for transporting a wire longitudinally into position between said jaws, and

means mounted in tandem alignment with said jaws for sensing an electrical wire in position between said jaws and for closing said jaws together to cold forge an electrical contact to the electrical wire in position between said jaws.

4,080,732
ENVELOPER FOR WRAPPING THE PLATES OF AN AUTOMOTIVE STORAGE BATTERY

William J. Eberle, Reading, Pa., assignor to General Battery Corporation, Reading, Pa.

Filed Feb. 24, 1977, Ser. No. 771,569
Int. Cl.[2] H01M *2/14*
U.S. Cl. 29—730 36 Claims

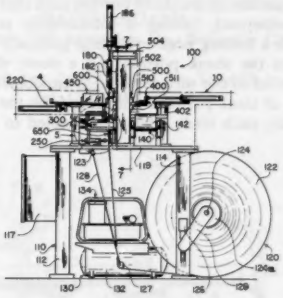
1. An apparatus for forming lead-acid storage battery plate envelopes from a continuous roll of sealable separator material, said apparatus comprising:

(a) material feed means for supplying material from said roll for use in said envelopes;

(b) draw means for drawing preselected lengths of separator material into a processing position;

(c) cut-off means for severing predetermined lengths of said material at said processing position into envelope forming lengths;

(d) means for folding said envelope forming lengths to overlap at least two portions of said separator material to be joined; and

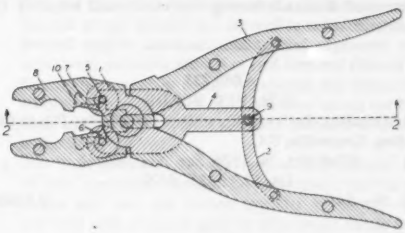


(e) means for sealing said overlapping portions together to form said battery plate envelope.

4,080,733
WIRE CUTTING PLIERS

John E. Clegg, 2320 Keystone Dr., Orlando, Fla. 32806

Filed Aug. 5, 1976, Ser. No. 712,422
Int. Cl.[2] B26B *13/26*
U.S. Cl. 30—102 4 Claims



1. Cutting pliers having crossed pivotally connected levers each with a handle on one end and a jaw on the other end, each jaw having groove means extending longitudinally of the jaws, rotatable opposed circular disk cutting blades with shafts, said groove means accommodate said shafts and guide the movement of the blades, a yoke having slots on one end to receive said shafts and the other end of the yoke pivotally connected to arms which pivotally connect to the handles whereby when the handles are closed the yoke will force the blades toward the end of the jaws.

4,080,734
METHOD AND APPARATUS FOR REMOVING A VEHICLE WINDSHIELD

Deryle R. Barbour, 632 Martin St., Clarksville, Tenn. 37040

Filed Sep. 24, 1976, Ser. No. 726,437
Int. Cl.[2] B25F *3/00*; B26B *3/04*
U.S. Cl. 30—123 9 Claims

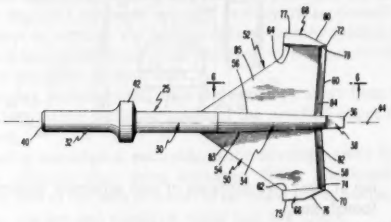
9. A tool for rapidly removing a damaged windshield resiliently bonded to a frame of a vehicle, comprising:

a shank portion having a frustoconical section terminating at a first end, a cylindrical section terminating at a second end, a nose at the first end, a longitudinal axis, and a radially outwardly extending collar which cooperates with the cylindrical section to provide a bit whereby the

second end may be mounted in a pneumatically driven tool holder;

a pair of wing portions lying essentially in one common plane, each wing portion being welded to the frustoconical section of the shank portion such that the nose extends therebeyond, having a substantially trapezoidal shape with a cutting edge extending generally perpendicularly from the shank portion and a short edge substantially parallel to the surface of the frustoconical section;

a pair of blade portions extending from the same side of the plane, each blade portion connected to a corresponding



short edge of a corresponding wing portion and having a cutting edge facing the first end, one blade portion cutting edge having a length which exceeds the length of the other blade portion cutting edge; and

each cutting edge of the wing portions and the blade portions being defined by a pair of convergent surfaces, one convergent surface being short and the other convergent surface being long so that the cutting edge is urged toward a windshield edge by the long convergent surface and restrained from contacting the windshield edge by the short surface.

4,080,735

SCRAPER BLADE

Arnold Michalski, Easley, S.C., assignor to Phillips Fibers Corporation, Greenville, S.C.

Filed Oct. 14, 1976, Ser. No. 732,246
Int. Cl.[2] B25G *3/00*
U.S. Cl. 30—345 **9 Claims**

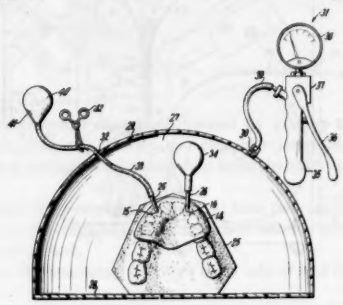
1. A scraper blade for cleaning the extrusion face of a spinneret used for spinning polyethylene terephthalate comprising poly(arylene sulfide) and carbonaceous filler wherein the amount of poly(arylene sulfide) ranges from about 40 to about 80 percent by weight and the amount of carbonaceous filler ranges from about 60 to about 20 percent by weight so that said scraper blade resists the tendency of the extruded molten polymer to stick thereto, said scraper blade being in the form of a plate having an edge tapered to produce a sharpened edge.

4,080,736

METHOD AND APPARATUS FOR FORMING A DENTAL PROSTHESIS

Leland T. Kennedy, Richmond, Va., assignor to IPCO Hospital Supply Corporation Whaledent International Division, New York, N.Y.

Continuation-in-part of Ser. No. 582,813, Jun. 2, 1975, Pat. No. 3,987,545. This application Sep. 20, 1976, Ser. No. 724,966
Int. Cl.[2] A61C *13/00*
U.S. Cl. 32—2 **11 Claims**



1. A method for forming a dental prosthesis in situ, comprising: forming an elastomeric mold of a corrected model of tooth areas to be restored; performing tooth preparatory work in the tooth areas to be restored including the removal of portions thereof; forming a model of the tooth area prepared for restoration; making a pair of channels through the elastomeric mold at spaced apart locations therein; securing the elastomeric mold to the model to form an assembly including a mold cavity therein; placing the assembly in a vacuum chamber for pumping a vacuum inside of said chamber; connecting an overflow container within the vacuum chamber to one of the channels; connecting a source of liquid prosthesis forming material outside of the vacuum chamber to the other of the channels; closing the connection between said source of material and said assembly; pumping a vacuum inside of said chamber to a predetermined level, and opening the connection between the source of material and the assembly whereby atmospheric pressure acting on the liquid prosthesis forming the material pushes said liquid prosthesis forming material into the mold cavity.

4,080,737

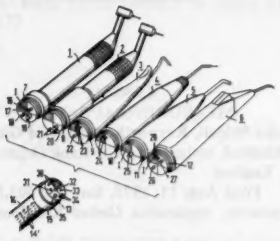
COUPLING DEVICE FOR DENTAL HANDPIECES

Ernst Otto Fleer, Bensheim Auerbach, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Oct. 14, 1976, Ser. No. 732,405
Claims priority, application Germany, Nov. 3, 1975, 2549177
Int. Cl.[2] A61C *19/02*
U.S. Cl. 32—22 **14 Claims**

1. In a coupling device for detachably connecting a medical device, which requires at least one operating medium, in particular a dental tool, including a turbine handpiece having a spray air conduit, a water conduit, and a main gas propulsion conduit; a micromotor handpiece having a high volume gas flow conduit and a pair of electrical conductors; an ultrasonic handpiece having a spray water conduit and a pair of conductors for the high frequency drive current; an electrical surgical handpiece having a pair of high frequency energy conductors; an illumination handpiece having a light conductor; and a spray handpiece having a spray air conductor and spray water conduit, to a supply tube containing feed lines for at least one of the operating mediums, said coupling device including a pair

of coupling halves with a first coupling half connected to the medical device and having a first coupling link for each of the conduits and a second coupling half connected to the supply tube and having a second coupling link for each feed line, and means interconnecting the pair of coupling halves with the first and second coupling links coacting to interconnect the feed line of the supply tube to the respective conduit of the medical



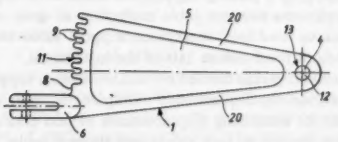
device, the improvement comprising the first and second coupling links for each operating medium being provided on said first and second halves in a specific spatial position in accordance with a pattern so that the second coupling half can be selectively connected to a feed line for each of the above mentioned operating mediums and can be used in a coupling device for different medical devices which require different selected operating mediums.

4,080,738

COPYING DEVICE FOR TAILOR'S TRADE

Guenther Krieger, Lahr, Germany, assignor to Verlag Aenne Burda, Offenburg, Germany

Filed Jan. 14, 1976, Ser. No. 649,077
Claims priority, application Germany, Jan. 14, 1975, 2501249
Int. Cl.² B43L *13/00*
U.S. Cl. 33—18 R **9 Claims**



1. A tailor's copying device of the type including an elongated copying wheel holder including a lug adapted to receive a copying wheel and an elongated marker holder and wherein one of said holders forms a handle portion and said holders mounted to each other and are relatively rotatable in mutually parallel planes both perpendicular to the orientation of said copying wheel and in adjustable and lockable fashion for setting a lateral spacing therebetween, and wherein said marker holder includes means for carrying a marker oriented perpendicular to the parallel planes or relative rotation of said copying wheel holder and said marker holder and wherein said marker includes a dusting device for applying a powderous marking material the improvement comprising:

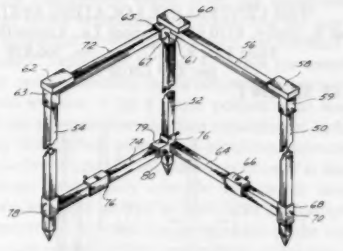
mounting means mounting said copying wheel holder in coextensive relationship over said marker holder and including a bearing boss projecting upwardly from one extremity of said marker holder and a mating recess formed in one extremity of said copying wheel holder for fitting over said bearing boss, said mounting means further including a longitudinally projecting locking rib formed at the extremity of said marker holder opposite said one extremity and a plurality of transversely spaced apart locking notches formed in the extremity of said copying wheel holder opposite said one extremity and each selectively engagable with said locking rib to cooperate with said bearing boss and mating recess to lock said holders relative to one another.

4,080,739

BATTER BOARD

Donald J. Ruhaak, 116 Arborview Dr., Nebraska City, Nebr. 68410

Filed Aug. 24, 1976, Ser. No. 717,417
Int. Cl.² E04G *21/18*
U.S. Cl. 33—86 **6 Claims**



1. A batter board unit for use in building construction comprising:

first and second elongate substantially rigid support members each having a first and second end and longitudinal axes which are substantially parallel and in the same plane;

first and second substantially rigid elongate alignment members of approximate equal length having a first and second end, said first alignment member removably affixed at said first end thereof to said first end of said first support member and at said second end thereof to said first end of said second support member, said second alignment member selectively movably affixed at said first end thereof to said first support member and at the second end thereof to said second support member for movement along the longitudinal axes of said support members between said first and second ends thereof;

a first slide member selectively movably affixed to said second alignment member for movement therealong between said first and second support members, whereby said first slide member may be selectively located in substantially any position within the plane defined by the axes of said first and second support members and said first and second ends of said support members;

a third elongate substantially rigid support member having a first and second end and a longitudinal axis which is substantially parallel to the longitudinal axes of said first and second support members, the plane defined by the longitudinal axes of said third and second members being substantially perpendicular to the plane defined by the longitudinal axes of said first and second support members;

third and fourth substantially rigid elongate alignment members of approximate equal length having a first and second end, said third alignment member removably affixed at said first end thereof to said first end of said second support member and at the second end thereof to said first end of said second support member, said fourth alignment member selectively movably affixed at said first end thereof to said second support member and at the second end thereof to said third support member for movement along the longitudinal axes of said second and third support members between said first and second end thereof;

a second slide member selectively movably affixed to said fourth alignment member for movement therealong between said second and third support members whereby said third slide member may be selectively located in substantially any position within the plane defined by the axes of said second and third support members and said first and second ends of said support members;

said second and fourth alignment members are selectively movably affixed to said support members by couplings on the ends of said second and fourth alignment members which at least partially encompass, respectively, said support members, the said second and fourth alignment members both attached to the same coupling on said second support member, whereby said second and fourth alignment members traverse as a unit along the axial direction of said support members.

4,080,740

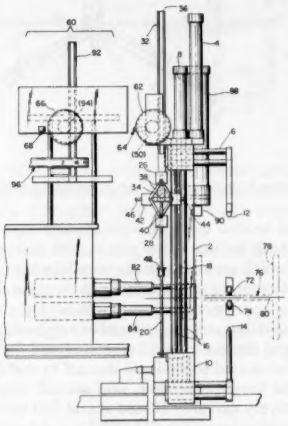
WEB CENTERLINE LOCATING SYSTEM

Ernest K. Haley, 1210 Old Cannons La., Louisville, Ky. 40205

Filed Feb. 8, 1977, Ser. No. 766,828

Int. Cl.[2] G01B 5/02

U.S. Cl. 33—174 L **11 Claims**



1. A web centerline locating system for determining the centerline of the vertical thickness of the web of structural steel members and the like comprising, in combination:

A. a frame supporting both a first actuator means, connected to the proximate end of a first probe for vertical positioning thereof, and a second actuator means, connected to the proximate end of a second probe for vertical positioning thereof; wherein,

B. the distal ends of said probes are constrained for a colinear vertical movement, and said first probe distal end is downwardly extending and constrained for a vertical movement which is above an upwardly extending distal end on said second probe, wherein the distal end of the first probe is operable for contact upon the top of a horizontally disposed web, and the distal end of the second probe is operable for contact on the bottom of said web; and,

C. means for sensing the vertical location of the centerline of said web, said means further comprising a first bellis block, disposed for free vertical travel, and a second bellis block, disposed for free vertical travel colinear with and below said first bellis block, a bellis center section disposed between said first and second blocks with interconnection means to each of said blocks for maintaining said center section equidistant between variable vertical positions of said first and second blocks; and

D. indicator means operably connected to said bellis center section for indicating and referencing the various vertical positions assumed by said center section; and

E. first contact means connected to the proximate end of said first probe for determining the vertical locations assumed by said first bellis block, and second contact means connected to the proximate end of said second probe for determining the vertical positions assumed by said second bellis block, whereby, when said first and second probes respectively are urged into contact with a horizontally disposed web, said indicator means is operable to indicate the vertical location of the centerline of the vertical thickness of said web.

4,080,741

MEASURING APPARATUS

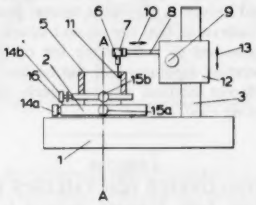
Graham John Siddall, Keyworth, and David Garratt, Hinckley, both of England, assignors to The Rank Organisation Limited, London, England

Filed Aug. 11, 1975, Ser. No. 603,582

Claims priority, application United Kingdom, Aug. 7, 1974, 34767/74

Int. Cl.[2] G01B 7/34

U.S. Cl. 33—174 L **9 Claims**



1. A method of setting the pick-up of an instrument of the type comprising:

a workpiece support table,

an X-Y coordinate table mounted on the support table,

a pick-up on a pick-up support mounted with respect to said workpiece support table such that at least one of said pick-up and said workpiece support table are rotatable about a fixed datum axis of the instrument,

adjustment means carried by said workpiece support table to rectilinearly displace said workpiece support table, and

means for measuring displacements of said coorindate table with respect to said workpiece support table,

whereby to position said pick-up at a selected radial position, said method comprises the steps of:

locating on said X-Y coordinate table a reference body having an at least partly cylindrical surface,

centering said reference body on said X-Y coordinate table with respect to said datum axis by causing said pick-up to traverse over the cylindrical surface of said reference body and adjusting said adjustment means of said workpiece support table until the pick-up output is substantially constant at a certain value,

adjusting said X-Y coordinate table to displace said reference body by a selected distance away from said datum axis,

adjusting the radial position of said pick-up until it contacts the surface of said reference body,

turning one of said reference body and said pick-up back and forth over a limited range about said datum axis to establish the relative angular position of said pick-up and said reference body corresponding to a turning point of the output signal from said pick-up, and

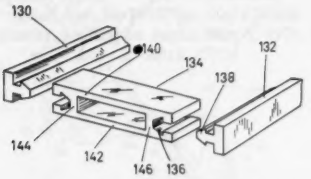
further adjusting the radial position of said pick-up while continuing to effect back and forth turning movement of one of said pick-up and said reference body, to adjust the value of the pick-up output signal at said turning point to a selected value.

4,080,742

KIT OF PARTS FOR FORMING A CURVED MEMBER, AND CURVED MEMBER FORMED THEREBY

James L. Osterried, P.O. Box 178, Pense, Saskatchewan, Canada

Continuation-in-part of Ser. No. 533,777, Dec. 18, 1974, abandoned. This application Dec. 19, 1975, Ser. No. 642,428
Claims priority, application Canada 212931, Nov. 4, 1974
Int. Cl.[2] B43L *13/22*; G01B *3/14*; A63H *33/10*
U.S. Cl. 33—177 10 Claims



1. A curved member comprising a pair of elongated strips having a longitudinally constant cross section and flexible in at least one plane, and a plurality of identical connectors, each of said connectors being integrally formed of a single piece of material and having two spaced apart identically shaped grooves, one of said grooves extending across each end portion of the connectors, said grooves being engaged as a snap fit with a tongue portion attached to a respective strip, said grooves of each connector being infinitely adjustable in position along each of said strips to alter the curvature of the member, said grooves being such as to hold the strips frictionally against longitudinal movement relative to the connectors, and being such as to hold the strips at a substantially constant angle to the connectors, whereby the curvature of the member is normally maintained, and wherein said connectors are formed of flexible plastics material and comprise a base member spanning between lower parts of said end portions, and a cantilever member extending inwardly from the upper part of at least one end portion and adapted to spread open the associated groove when said cantilever member is depressed.

5. A curved member suitable for use as a graphic design instrument comprising a pair of elongated strips having a longitudinally constant cross section and flexible in at least one plane, and a plurality of identical connectors, each of said connectors being integrally formed of a single piece of material and having two spaced apart identically shaped joint means, said joint means being engaged with a respective strip, said joint means of each connector being infinitely adjustable in position along each of said strips to alter the curvature of the member, said joint means being such as to hold the strips frictionally against longitudinal movement relative to the connectors, and being such as to hold the strips at a substantially constant angle to the connectors, whereby the curvature of the member is normally maintained, and in which said joint means includes means by which said connectors are attachable to said strips in a first position wherein said connectors are easily adjustable along the length of said strip and in a second position wherein said connectors are substantially held in their location on said strip.

9. A curved member comprising at least three elongated strips having a longitudinally constant cross section and flexible in at least one plane, and a plurality of identical connectors, each of said connectors being integrally formed of a single piece of material and having spaced apart identically shaped joint means equal in number to said strips, each joint means being engaged with a respective strips, said joint means of each connector being infinitely adjustable in position along each of said strips to alter the curvature of the member, said joint means being such as to hold the strips frictionally against longitudinal movement relative to the connectors, and being such as to hold the connectors at a substantially constant angle to the adjacent portions of the strips, whereby the curvature of the member is normally maintained, said strips presenting smooth edges on the sides thereof remote from the connectors.

4,080,743

MEMBRANE DRYING PROCESS

Philip Manos, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 22, 1976, Ser. No. 698,696
Int. Cl.[2] B01D *31/00*
U.S. Cl. 34—9 6 Claims

1. In the process for drying a semipermeable polymeric membrane that is wet with an aqueous membrane-wetting liquid by contacting the wet membrane with at least one replacement liquid to remove water from the membrane, and removing the replacement liquid from the membrane; the improvement which comprises first contacting the wet semipermeable polymeric membrane in which the polymer has a Critical Surface Tension of at least 42 dynes per centimeter with at least one replacement liquid consisting essentially of a homogeneous solution of (a) a major portion of at least one organic solvent selected from the class consisting of hydrocarbons having 4–8 carbon atoms and perchlorofluorocarbons having 1–3 carbon atoms and (b) a minor portion of at least one organic solvent substantially miscible with water having a hydrogen bonding parameter of at least about 1.5 (calories per cubic centimeter)$^{1/2}$, wherein the components of the replacement liquid each exhibit, at 20° C, a viscosity of less than about 10 centipoise and a molar volume of less than about 200 cubic centimeters per mole; and after water has been substantially completely removed from the membrane, evaporating the replacement liquid to obtain a membrane free of water and replacement liquid.

4,080,744

GAS SEPARATION MEMBRANE DRYING WITH WATER REPLACEMENT LIQUID

Philip Manos, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 22, 1976, Ser. No. 698,697
Int. Cl.[2] B01D *31/00*
U.S. Cl. 34—9 5 Claims

1. In the process for drying a semipermeable polymeric membrane that is wet with an aqueous membrane-wetting liquid by contacting the wet membrane with at least one water replacement liquid inert to the membrane and to the membrane-wetting liquid to remove water from the membrane, and removing the replacement liquid from the membrane; the improvement which comprises contacting said wet polymeric membrane in which the polymer has a Critical Surface Tension of at least about 42 dynes per centimeter, at a temperature of about from 0° to 50° C. with a water replacement liquid consisting essentially of at least one organic solvent which is selected from the group consisting of aliphatic alcohols having 4–8 carbon atoms, aliphtic aldehydes having 3–8 carbon atoms and aliphatic ketones having 3–8 carbon atoms, carboxylic acids, carboxylic esters having 4–8 carbon atoms, aliphatic nitriles, ethers, acetals, ketals, amines, halocarbons having 1–3 carbon atoms and containing at least one hydrogen atom, and aqueous solutions thereof, said solvent having a surface tension at 20° C. of not more than about 35 dynes per centimeter, a viscosity less than about 10 centipoise, a molar volume less than about 200 cubic centimeters per mole at 20° C, a solubility for water not greater than about 20 weight percent at the contacting temperature, and a hydrogen bonding parameter of at least about 1 (calorie per cubic centimeter)$^{\frac{1}{2}}$; and after water has been substantially completely removed from the membrane, evaporating the replacement liquid to obtain a membrane free of water and replacement liquid.

4,080,745

FOOTWEAR

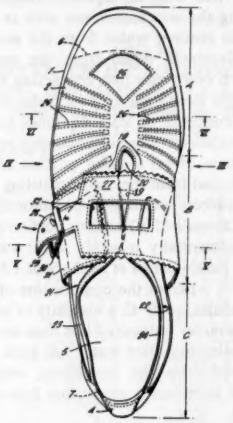
Joseph Torrance, 51 Rylees Pl., Penilee, Glasgow, Scotland

Filed May 19, 1976, Ser. No. 688,907

Claims priority, application United Kingdom, May 21, 1975, 21720/75

Int. Cl.[2] A43B *11/00, 7/06, 5/00*

U.S. Cl. 36—50 22 Claims



1. Footwear comprising a sole structure, an upper connected to the sole structure and including a rear portion and a pair of opposed intermediate portions together providing a top opening through which the foot is insertable, the intermediate portions of the upper including a pair of laterally opposed top parts foldable onto the instep portion of the foot, a fastener on the sole structure including a pair of flexible straps extending respectively from opposite sides of an intermediate portion of the sole structure and interconnectible to enclose the intermediate portions of the upper and thereby clamp the top parts of said intermediate portions to the instep portion of the foot, said top parts of the intermediate portions of the upper are foldable onto the instep portion of the foot to form a slot extending forwardly and downwardly over the instep portion of the foot, the straps are manipulable to a securing position in which they extend around the respective intermediate portions of the upper and one of the straps extends over the slot and overlaps the other strap, and means are provided for releasably interconnecting the straps in their securing position.

4,080,746

LOADER BUCKET ASSEMBLY FOR EARTH WORKING EQUIPMENT

Thomas G. Frazzini, Export, Pa., assignor to Asbury Industries, Inc., Pittsburgh, Pa.

Filed Mar. 17, 1977, Ser. No. 778,366

Int. Cl.[2] E02F *3/76*

U.S. Cl. 37—117.5 10 Claims

1. A loader bucket assembly for an earth working machine comprising,

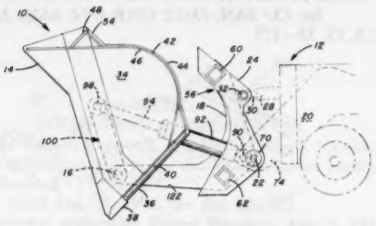
a bucket portion having a back plate engaged to a pair of spaced parallel sidewalls and a floor plate to form an open forward portion for receiving and discharging materials,

a carrier portion positioned rearwardly of said bucket portion and having a pair of spaced parallel arm members positioned outboard of said bucket sidewalls,

pivot means secured to said bucket sidewalls for connecting said carrier arm members to said bucket sidewalls to permit pivotal movement of said bucket portion through an arcuate path toward and away from said carrier portion,

first actuator means connected to said carrier portion for forwardly pivoting said carrier portion and said bucket portion to a first position for discharging the contents of said bucket portion,

second actuator means mounted on said carrier portion and connected to said pivot means for moving said bucket portion from said first position to a second position relative to said carrier portion,



control means for actuating said first actuator means to pivotally move said carrier portion and said bucket portion to said first position, and

said control means being further operable to automatically actuate said second actuator means after actuation of said first actuator means to forwardly pivot said bucket portion on said carrier portion to complete the discharge of the contents of said bucket portion.

4,080,747

DISPLAY DEVICE

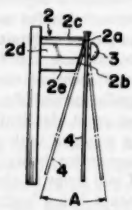
Taketoshi Kato, No. 1-14-11, Ginza, Chuo, Tokyo, Japan

Filed May 21, 1976, Ser. No. 688,632

Claims priority, application Japan, May 21, 1975, 50-67904[U]

Int. Cl.[2] G09F *19/02*

U.S. Cl. 40—613 8 Claims



1. A display device comprising a base panel having a plurality of plastic unit panels, each of said unit panels having a plastic projecting arm formed integrally with said unit panel at the center of said unit panel and near the top of said unit panel, a rivet, having a rivet head, embedded in the terminal top end surface of said projecting arm, and a reflector plate loosely and swingably fitted to said rivet, wherein said terminal top end surface of said projecting arm and said rivet comprise means for restricting the swinging movement of said reflector plate about said rivet in a direction toward and away from said unit panel as the back surface of said reflector plate contacts one end of said terminal top end surface of said projecting arm and the front surface of said reflector plate contacts one end of said rivet during swung positions of said reflector plate, said terminal top end surface of said projecting arm has a width greater than the height thereof in front view and comprises a vertical upper surface section and an inclined lower surface section, said upper surface section being parallel to said unit panel while said lower surface section being inclined toward said unit panel as it extends downwardly from the upper surface section, the degree of inclination of said lower surface section and the height of said rivet being such that when said reflector

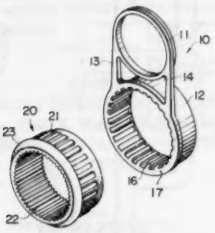
plate positioned in a normal suspended position is swung backward about said rivet, the upper front surface of said reflector plate contacts the upper end of the head of said rivet, and the lower end of said reflector plate is still slightly spaced from said unit panel.

4,080,748

LINE GUIDE ASSEMBLY FOR FISHING RODS

Ryuichi Ohmura, Shizuoka, Japan, assignor to Fuji Kogyo Co., Ltd., Shizuoka, Japan

Filed Apr. 20, 1976, Ser. No. 678,493
Claims priority, application Japan, May 1, 1975, 50-53503
Int. Cl.[2] A01K *87/04*
U.S. Cl. 43—24 **5 Claims**



1. A line guide assembly for a fishing rod comprising, in combination, a metallic main frame of an integral single body construction, said main frame having a seat tube for receiving the fishing rod, a pair of substantially parallel arms upstanding from one edge of said tube, and an eye ring for passing a fishing line therethrough, supported by said arms with its axis parallel to the axis of said seat tube; and an elastic protective sleeve forcedly inserted into said seat tube, the axial length of said sleeve being larger than that of said seat tube; said seat tube having a plurality of axially aligned grooves in the inner periphery thereof and said sleeve having a corresponding number and shape of axially aligned projections on the outer periphery thereof, said grooves and projections thereby cooperating to prevent relative axial movement between said sleeve and said tube; said sleeve having a flange around the outer periphery and at one end thereof, said flange abutting one end of said tube; said tube having a circular lip at the inner periphery of the other end thereof to engage the outer surface of said elastic sleeve; said flange and said lip thereby preventing separation of said tube and said sleeve; said sleeve having a plurality of axially aligned indentations on the inner periphery thereof to provide a secure grip on the fishing rod.

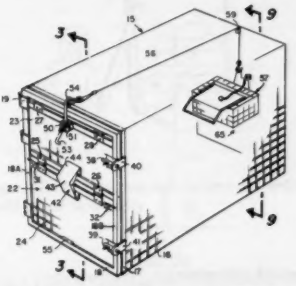
4,080,749

ANIMAL TRAP

John W. Gilbaugh, 19396 Monte Vista Dr., Saratoga, Calif. 95070

Filed Jun. 7, 1976, Ser. No. 693,360
Int. Cl.[2] A01M *23/16*
U.S. Cl. 43—61 **11 Claims**

1. In an animal trap of the cage type the combination of a cage of wire mesh, wood, sheet metal, synthetic materials or combination thereof, folding door frame means, a folding door consisting of two panels of approximate equal size hinged together and positioned inside said folding door frame means, a second frame means for receiving said folding door frame means, hinge means for attaching said folding door frame means to said second frame means for receiving said folding door frame means in one end of said cage, combination hook-and-lever means rotatably attached to the top segment of the upper of said door panels at approximately midpoint of said top segment of said upper door panel for latching said folding door in open position, combination trigger and bait basket means positioned in said cage connected by cable means to said rotatably attached combination hook-and-lever means, said last means being adapted to be actuated by an animal entering said cage through said open door and activating said combination trigger mechanism and bait basket means, said last mentioned means rotating said combination hook-and-lever means by exerting a pulling action on said cable means to release said open folding door when it is actuated by said animal, offset spring-loaded hinge means mounted at the center fold of said



folding door midway between hinges of said hinged together folding door panels to provide increased leverage for accelerating the closing of said folding door from its said open position when it is actuated by said animal, folding door lock means to hold said folding door securely in closed position while retaining said animal in captivity, removable service door means positioned at other end of said cage, locking means for said removable service door.

4,080,750

TOY AIRCRAFT

Arnaldo Palumbo, Via Cristoforo Colombo, Trezzano sul Naviglio (Milan), Italy

Filed May 28, 1976, Ser. No. 691,074
Claims priority, application Italy, Jan. 29, 1976, 20563/76[U]
Int. Cl.[2] A63H *33/00, 27/04*
U.S. Cl. 46—1 R **5 Claims**

1. A small toy including an aircraft slidable on a pair of strings, the aircraft being provided with an axial through-opening, the strings going through said opening, the toy comprising means for anchoring one end of the strings to a fixed point placed at a suitable height, said strings serving as the means for manipulation of said aircraft by the user whereby said aircraft may be slid back and forth therealong, means on said aircraft for holding and releasing a projectile, said latter means including a pivoted lever having holding and releasing positions, the upper end of said lever having the shape of a fork, one string being positioned to slide between the prongs of said fork when the device is in use and means on said one string adapted to move said fork from said holding to said releasing position, said moving means being located at a particular location on said one string passing the fork in one direction of movement of the aircraft.

4,080,751
INFLATABLE TOY SWORD

Terrance R. Copstead, P.O. Box 428, Issaquah, Wash. 98027

Filed Aug. 16, 1976, Ser. No. 714,391
Int. Cl.[2] A63H *33/00*
U.S. Cl. 46—1 R 6 Claims

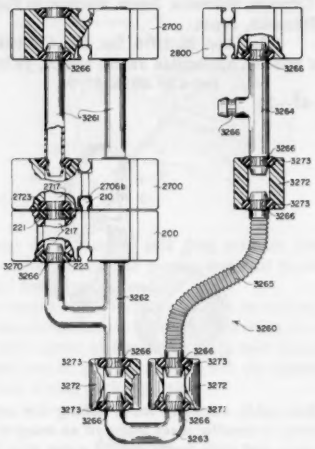
1. A toy sword comprising:
blade means comprising an inflatable resilient tubular air bag having a forward end and a rearward end;
means for inflating said air bag;
an open-ended tubular collar having an rearwardly facing interior annular surface;
said forward end of said tubular air bag being insertable into and through said open-ended tubular collar, said tubular air bag having a stiffener disc at said rear end, said stiffener disc being dimensioned to seat against said annular surface to prevent said rear end of said tubular air bag from being pulled through said open-ended tubular collar; and
means comprising a substantially rigid handle suitable for grasping with the hand,
said tubular collar including means for securing said handle means to said collar to hold said stiffener disc seated against said annular surface between said handle means and said annular surface.

4,080,752
TOY BLOCKS WITH CONDUITS AND FLUID SEAL MEANS

David A. Burge, 3594 Glencairn Rd., Shaker Heights, Ohio 44122

Filed May 1, 1975, Ser. No. 573,788
Int. Cl.[2] A63H *33/08*
U.S. Cl. 46—25 15 Claims

1. A construction set, comprising:
a. a first member having a first fluid conduit formed therein and having a substantially planar first face, the first conduit opening through the first face to define a first opening;
b. a second member having a second fluid conduit formed therein and having a substantially planar second face, the second conduit opening through the second face to define a second opening;
c. the first and second members being movable, while retaining the first and second faces substantially in a common plane, between a disconnected position, wherein the first and second conduits do not align, to a connected position where the first and second conduits align;
d. connection means including slidingly interfittable formations on the first and second members for interconnecting such members as they are moved from the disconnected position to the connected position, and for releasing a connection between such members as they are moved from the connected position to the disconnected position;
e. first and second resilient annular seal means carried respectively in the first and second openings and having annular sealing portions which normally extend outwardly from such openings, the sealing portions of one of the seal means operating to compress the sealing portions of the other seal means as the members are moved from the disconnected position to the connected position, and cooperating to establish fluid-tight communication between the first and second conduits when the members are in the connected position;
f. a third member having first and second projections formed thereon, and a third conduit extending between and opening through the projections;

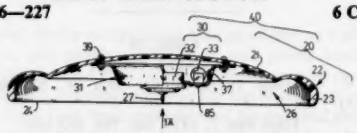


g. the first projection being configured to extend through and compressively engage the first seal means to establish fluid-tight communication between the first and third conduits; and,
h. the second projection being configured to extend through and compressively engage the second seal means to establish fluid-tight communication between the second and third conduits.

4,080,753
SIGNAL GENERATING FLYING SAUCER WITH THIN CENTRAL VIBRATILE PORTION

William D. Hiner, 5512 Floyd, Amarillo, Tex. 79106; Jimmy E. Hughes, 5017 W. 57 St., Amarillo, Tex. 79109, and Tommy J. Slaughter, 2002 Iris, Amarillo, Tex. 79107

Filed Mar. 28, 1977, Ser. No. 781,858
Int. Cl.[2] A63H *33/26, 27/00*
U.S. Cl. 46—227 6 Claims



1. A flying toy with audible sound producing means comprising a circular outer shell assembly and a sound producing assembly,
the outer shell assembly comprising a thin central vibratile portion and a peripheral skirt, said central portion being attached to the top end of said peripheral skirt, said skirt being thicker than said central portion of said shell and said skirt terminating at a lower edge thereof in a circular rim and a shell chamber being enclosed within said outer shell assembly and said outer shell assembly being axially symmetrical about a common central vertical axis,
the sound producing assembly comprising, in operative combination a central case assembly, a buzzer, a battery,

and a centrifugal motion sensor means sensitive to the rotational speed of said outer shell, and said buzzer, said battery and said sensor being located in said central case assembly, said central case assembly comprising a casing located in said shell chamber between the top of said central portion and said rim at the lower edge of said skirt and above said rim, said casing being fixed to said outer shell and said casing being axially symmetrical about said axis,

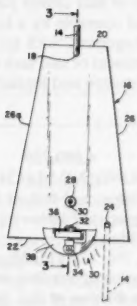
said shell chamber being closed at its top by said shell assembly and having a bottom opening bounded by said circular rim and said outer shell assembly extending over and peripherally of said central case assembly equally in all directions, said central portion providing means for enhancing the audible sound characteristics of the sound producing assembly.

4,080,754

DUAL-MODE SOUND-PRODUCING TOY

Herbert L. Nelson, 3560 S. Wells, Chicago, Ill. 60609

Filed Aug. 9, 1976, Ser. No. 698,310
Int. Cl.² A63H *5/00*
U.S. Cl. 46—228 **6 Claims**



1. A dual-aerodynamic-mode whirling sounding toy comprising:

a. a trapezoidal body;

b. tethering means for constraining the orbital path of said trapezoidal body;

c. attachment means in said body for said tethering means;

d. a whistle in said body operative produces a whistling sound when said body containing said whistle is moved rapidly through the air; and

e. said trapezoidal body being of greater thickness near the shorter of the parallel sides than near the longer of the parallel sides of the trapezoid.

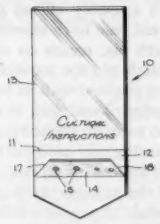
4,080,755

SEED TAPE-BEARING REFLECTIVE PLANT MARKER

Leslie O. Crosby, 804 Stump Rd., Chalfont, Pa. 18914

Filed Jul. 26, 1976, Ser. No. 708,685
Int. Cl.² A01C *1/04*
U.S. Cl. 47—56 **13 Claims**

1. A seed-bearing marker comprising a tab having a ground line on the front face thereof at a level appropriate to the type of seed being sown, the ground line dividing the front face into a short lower section insertable into the soil and a longer upper section above the soil, a piece of biodegradable tape extending across the lower section parallel to the line, said tape encapsulating a charge of seed, the ends of said tape being mechanically latched to said tab, there by avoiding the presence of chemical bonding agents that might react unfavorably with the seeds or the soil, said upper face having a highly reflective layer thereon whereby incident light is reflected by this layer, and seedlings emerging from the seed are exposed both to incident light and to reflected radiation to a degree whereby



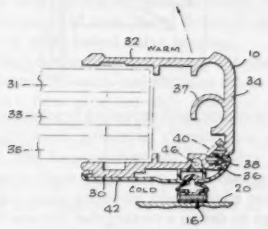
the seedlings will not elongate and incline toward the source of light but will grow upwardly.

4,080,756

INSULATED REFRIGERATOR DOOR FRAME

James J. Heaney, Glendale, Calif., assignor to Anthony's Manufacturing Company, Inc., San Fernando, Calif.

Filed Oct. 9, 1975, Ser. No. 621,202
Int. Cl.² E06B *7/12*
U.S. Cl. 49—70 **13 Claims**



1. A door frame structural member for use in a door of a refrigerated cabinet, said member having the general form of a channel of U-shaped cross-section, comprising:

a first flange portion adapted to be exposed, in the door's normally closed position, to the normally warmer air outside the refrigerated cabinet;

an intermediate central portion integral with said first flange portion and substantially perpendicular to it;

a second flange portion substantially parallel with said first flange portion and disposed in spaced relation to said first flange portion, a part of said second flange portion adapted to extend, in the door's normally closed position, into the normally colder air inside the refrigerated cabinet and a part of said second flange portion nearest said intermediate central portion adapted to extend into the normally warmer air outside the refrigerated cabinet; and

a thermal barrier portion of thermally insulative material interposed between said second flange portion and said intermediate central portion and holding those portions in rigid spaced-apart relationship, whereby heat absorbed by said intermediate central portion is prevented from entering the interior of the refrigerated cabinet via said second flange portion.

4,080,757

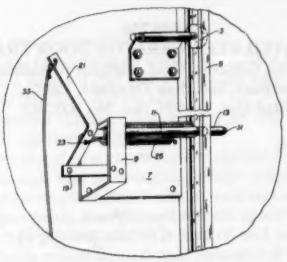
DOOR LATCH

Floyd Westerman, 3421 Stewarton Dr., Richmond, Calif. 94803

Filed Sep. 20, 1976, Ser. No. 725,102
Int. Cl.² E05D *17/00*
U.S. Cl. 49—322 **1 Claim**

1. In combination a warehouse type door having rollers riding in guide tracks installed to each vertical side of the door

opening, for use in raising said door from a down closing position to an up open position, means for normally resisting downward movement of said door from its up open position, and a safety latch assembly affixed to said door adjacent a verticle edge thereof, said latch assembly comprising a mounting bracket, a latch pin, means on said bracket for slidably supporting said latch pin for movement towards said track from a nonlatching position with its latching end in proximity to the proximate edge of said door to a position with its latching end adapted to enter an aligned hole in the adjacent track, means normally biasing said latch pin toward its latching position whereby said latch pin will ride with its latching end in engagement with the adjacent track as said door is raised or lowered until it should align with a hole in said track, said track having such hole in line with said latch pin to receive said latch pin when said door in in its open position to function as a safety support for said door in the event of failure of said normal



restraining means, said mounting bracket comprising a mounting plate and laterally extending mounting flange, a tubular member welded to the underside of said flange for slidably supporting said latch pin, a right angle component connected at its lower edge to said mounting plate and its upper edge to said flange to define a rectangular framework, a lever support arm affixed to a vertical section of said right angle component and having a free extremity, with the lower end of said lever arm pivotally connected to the free extremity of said lever support arm, said means normally biasing said latch pin toward its latching position including a spring anchored under tension at one end to said lever at an intermediate point thereof, and at its other end to said bracket, said lever terminating in a free end above said intermediate point and beyond the pivotal connection of its lower end, to permit of a downward motivating force to said lever to rotate said lever about said pivotal connection to withdraw said latch pin from its latched position.

4,080,758

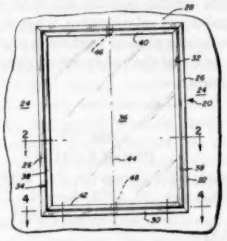
WINDOW SAFETY SYSTEM

S. Eugene Hubbard, Niles, Mich., assignor to Kawneer Company, Inc., Niles, Mich.

Filed Feb. 11, 1976, Ser. No. 657,192

Int. Cl.[2] E06B *3/40*

U.S. Cl. 49—390 **19 Claims**



1. In combination, a window frame having members including a header, a sill and a pair of jambs defining a sash receiving opening;

a sash member mounted in said opening for pivotal movement about a pivot axis extended transversely between opposite one of said frame members between a closed, open and a reverse position relative to said frame member; and

a releasable latch assembly positioned apart from said axis and one of said jambs at an adjustably selected spacing therebetween, said latch assembly interconnecting said frame member and said sash member for limiting the amount of initial pivotal opening movement of said sash member out of said closed position into a limited open position and including key releasable means operable for permitting further pivotal opening movement of said sash member out of said limited open position through a freely pivotal open position toward said reverse position, said latch assembly including an arm pivotally attached to one of said members and including a slot therein having an opening for slidably receiving a pin mounted on another of said members,

said key releasable means including means for limiting the pivotal movement of said arm for preventing disengagement of said pin from said opening of said slot thereby limiting the amount of pivotal opening movement of said sash member out of said closed position, into said limited open position and operable by a key to permit said pin to move out of engagement with said slotted arm allowing free pivotal movement of said sash member relative to said frame member between said limited open position and said reverse position.

4,080,759

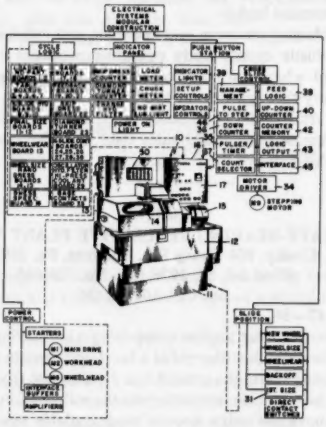
GRINDING MACHINE

John Klar, West Boylston, and Robert H. Lizotte, Leominster, both of Mass., assignors to Cincinnati Milacron-Heald Corporation, Worcester, Mass.

Continuation of Ser. No. 579,915, May 22, 1975, abandoned, which is a continuation of Ser. No. 466,272, May 2, 1974, abandoned, which is a division of Ser. No. 238,395, Mar., 1972, Pat. No. 3,820,287. This application Sep. 7, 1976, Ser. No. 720,890

Int. Cl.[2] B24B *51/00*

U.S. Cl. 51—165 R **1 Claim**



1. A grinding machine for generating a surface of revolution on a workpiece by use of an abrasive wheel, comprising

(a) a base,

(b) a workhead mounted on the base for supporting and rotating the workpiece about the axis of the surface of revolution,

(c) a wheelhead mounted on the base for supporting and rotating the abrasive wheel about its axis,

(d) a feed box containing electrical circuitry for controlling relative movement of the workhead and wheelhead both parallel to and perpendicular to the said axis of the surface of the revolution in accordance with a predetermined sequence of events significant to a human operator to produce a grinding cycle,

(e) a display panel having indicia showing in linear sequential arrangement the sequence of events normally taking place in the machine, there being lamps mounted on the panel and located at the indicia indicating the various events,

(f) circuit means located in the feed box and connected to the lamps to actuate a specific lamp at the time that is associated event takes place and to deactivate said lamp when the associated event fails to take place, said circuit means in the feed box being carried on circuit boards, each event being controlled by at least one circuit board, so that, when a lamp associated with a given event fails to be actuated, the circuit board associated with that event can be replaced, and

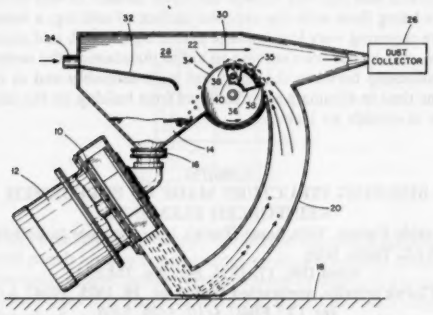
(g) a diagram mounted on the machine adjacent the circuit boards, the diagram representing the various events in block form and indicating which circuit board controls each event.

4,080,760

SURFACE TREATMENT DEVICE INCLUDING MAGNETIC SHOT SEPARATOR

Raymond M. Leliaert, South Bend, Ind., assignor to Wheelabrator-Frye Inc., Hampton, N.H.

Filed Feb. 18, 1977, Ser. No. 770,093
Int. Cl.² B24C *9/00*
U.S. Cl. 51—425 **16 Claims**



12. In a surface treatment device for projecting ferromagnetic particulate onto a surface and recovering said particulate the improvements comprising:

means for separating said particulate from nonmagnetic debris generated by the treatment process, said separating means including:

(i) a perforated rotating drum,

(ii) means for magnetically attracting said particulate onto the surface of said drum at selected locations, and

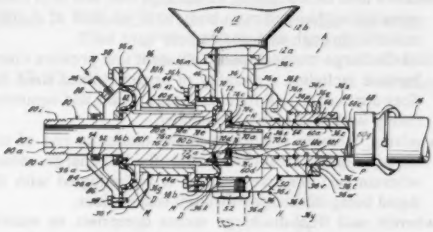
(iii) means positioned inside said drum for blowing air upwardly through the perforations in said drum only at said selected locations.

4,080,761

CONTROL VALVE ASSEMBLY

Albert L. Burns, Houston, Tex., assignor to Bowen Tools, Inc.

Filed Jan. 10, 1977, Ser. No. 757,880
Int. Cl.² B24C *7/00*
U.S. Cl. 51—438 **14 Claims**



1. A control valve assembly for regulating the mixing of abrasive from a pressurized tank and high pressure fluid from a high pressure fluid source to a tubular conductor for abrasive blasting operations, comprising:

a control valve housing having a fluid inlet end portion and a discharge outlet end portion;

said control valve housing having an abrasive inlet between said fluid inlet end portion and said discharge outlet end portion, the pressurized tank being mounted above said abrasive inlet of said control valve housing;

said control valve housing having a mixing chamber therein and in communication with said abrasive inlet;

a tubular abrasive flow pipe movably mounted with said discharge outlet end portion of said control valve housing, said tubular abrasive flow pipe having a first end extending into said mixing chamber and a second end extending beyond said discharge outlet end portion of said control valve housing and adapted to be connected to a tubular conductor;

an abrasive control nozzle mounted in said control valve housing for co-action with said tubular abrasive flow pipe;

moving means for moving said tubular abrasive flow pipe relative to said abrasive control nozzle to and from an open abrasive fluid mixing position from and to a closed position, respectively; and,

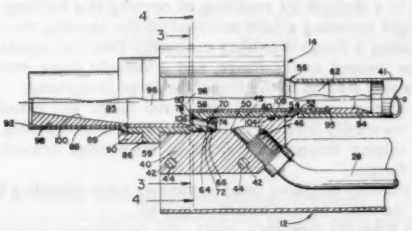
seal means for sealing between said first end of said tubular abrasive flow pipe and said abrasive control nozzle when said tubular abrasive flow pipe and said abrasive control nozzle are in said closed position.

4,080,762

FLUID-ABRASIVE NOZZLE DEVICE

John D. Watson, 906 E. Harmony La., Fullerton, Calif. 92631

Filed Aug. 26, 1976, Ser. No. 718,000
Int. Cl.² B24C *7/00*
U.S. Cl. 51—439 **12 Claims**



1. A fluid-abrasive nozzle device removably attacked to a gun-like structure for use in high-velocity, high-pressure fluid-

pump systems, including an abrasive material, wherein the nozzle comprises:

a main body having a fluid-inlet passage and a pressure chamber formed therein, said inlet communicating with said pressure chamber and connected to said liquid pump system;

abrasive inlet means having a discharge end, said inlet means mounted within said main body to allow flow of abrasive material through said nozzle device;

fluid-discharge means disposed adjacent said pressure chamber and including a plurality of predetermined sized orifices disposed in said fluid discharge means and communicating with said pressure chamber;

a mixing chamber positioned at the discharge end of said abrasive inlet means and said fluid-discharge means, wherein said abrasive material is intermingled with the liquid being discharged through said orifices;

wherein said fluid-discharge means comprises an annular discharge ring having said orifices equally spaced apart from each other in a circular arrangement around said ring, said orifices being inclined inwardly and forwardly of said chamber, wherein high-velocity fluid streams are discharged into said mixing chamber, said fluid and said abrasive material being commingled to be discharged in a homogeneous manner;

wherein said abrasive inlet means comprises:

a piston having a central passage therethrough to provide flow of said abrasive material through said nozzle;

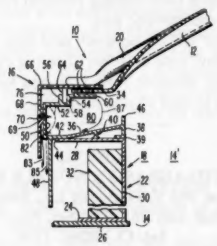
a piston head having a plurality of holes therethrough arranged in aligned relationship with said orifices of said discharge ring, said holes communicating with said mixing chamber whereby fluid from said orifices pass through said holes into said chamber.

4,080,763

SKYLIGHT FRAME CONSTRUCTION

Edward Sidney Naidus, Glen Rock, and Charles Wheeler Clark, Dumont, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Feb. 7, 1977, Ser. No. 766,563
Int. Cl.[2] E04B *7/18*
U.S. Cl. 52—200 **11 Claims**



1. In a skylight for enclosing an opening in a building, the skylight including a curb surrounding the opening, the curb including a flange extending outwardly from the opening, a frame secured to the flange, and a skylight dome member releasably secured to the frame, the frame comprising:

a bottom wall disposed above the flange and extending outwardly from an inner edge adjacent the opening and sloping downwardly from its inner edge toward the flange,

a plurality of spaced outer upstanding walls extending from the outer edge of said bottom wall,

an inwardly extending upper wall cantilevered from each said outer upstanding walls,

an inwardly extending dome member supporting lip cantilevered from and spaced above each said upper wall,

a plurality of spaced apron support members disposed on each said upper wall between said lip and said upstanding wall, said support members extending above said lip, and

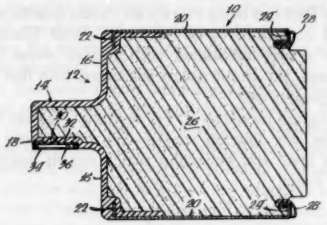
an outer apron including first and second legs, said first leg extending inwardly and located spaced from said upper wall and lip by said support members, said second leg depending downwardly from said first leg and secured spaced from and to said outer upstanding walls.

4,080,764

DOOR JAMB WITH ISOLATED HEAT STRIP

William J. Stowik, Hudson, and Kenneth L. Kaiser, North Hudson, both of Wis., assignors to The Vollrath Company, Sheboygan, Wis.

Filed Jun. 25, 1976, Ser. No. 699,717
Int. Cl.[2] F25D *21/06*
U.S. Cl. 52—173 R **2 Claims**



1. A jamb assembly for a door having a sealing gasket closing off a sealed low temperature compartment having a generally T-shaped configuration in which the leg of said jamb and its adjacent surfaces are constructed of a reinforced fiberglass material and the majority of the balance thereof is a foam material, said jamb leg including an exposed surface positioned to be contacted by the door in its closed position, said exposed surface having a recess therein, which jamb assembly will not rust or corrode, and its also sufficiently rugged and durable, so that it will not crack when it gets cold, or melt when it gets too warm, the assembly further includes an isolated heat strip assembly consisting of a metallic enclosure secured within the recess of said exposed surface the outer surface of said enclosure being flush with the exposed surface of said leg, a heater wire requiring very low wattage extending through said enclosure, said heater wire serving to aid in maintaining the sealing relationship between the door and jamb assembly and at the same time to eliminate any chance of frost buildup on the jamb due to outside air leakage.

4,080,765

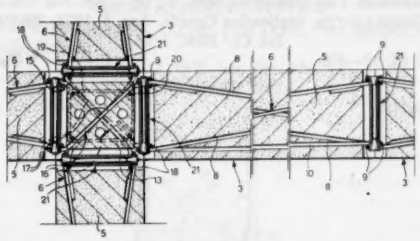
BUILDING STRUCTURE MADE OF PREFORMED REINFORCED ELEMENTS

Osvaldo Fasano, Villarbasse (Turin), Italy, assignor to Edilstart S.r.l., Turin, Italy

Filed Dec. 17, 1976, Ser. No. 751,834
Claims priority, application Italy, Dec. 19, 1975, 70147 A/75
Int. Cl.[2] E04C *3/10, 3/26, 5/08*
U.S. Cl. 52—228 **3 Claims**

1. A building structure comprising a number of modular structural elements which serve as walls, pillars and beams and means for interconnecting said modular elements upon assembly to form a rigid structure, each modular element comprising an internally reinforced block the internal reinforcement of which has a number of appendices projecting outwardly from each of the faces of the element which upon assembly are coupled with a corresponding face of an adjacent modular element, each appendix including an eye adapted to be disposed side by side and partly superimposed with a corresponding eye of an appendix of an adjacent modular element, each pair of eyes superimposed being aligned upon assembly of the structure with another corresponding pair of eyes, an elon-

gated body cooperating with every two aligned pairs of eyes, said elongated body having radially deformable ends housed within said aligned pairs of eyes, a conical member disposed at each end of the elongated body for cooperation with the radi-



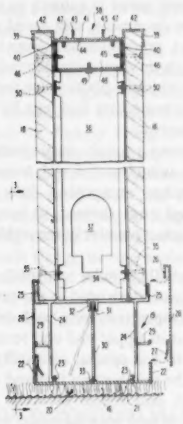
ally deformable ends of the elongated body and means for effecting displacement of said conical members into the radially deformable ends of the elongated body so as to cause radial expansion of such ends to tension the superimposed eyes of each aligned pair.

4,080,766

DEMOUNTABLE PARTITION STRUCTURE

John Jastrabek, Bedminster, N.J., assignor to Claremont Wall Systems Company, Inc., Bedminster, N.J.

Filed Mar. 4, 1977, Ser. No. 774,644
Int. Cl.² E04B *2/74*
U.S. Cl. 52—242 **9 Claims**



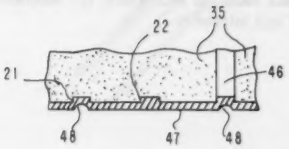
1. In a demountable assembly of the type wherein a plurality of wall panels are positioned in edge-to-edge alignment in two horizontally spaced parallel vertical planes by means of a series of panel supporting members carried at spaced intervals along the length of an elongated extruded floor channel placed at any chosen location on a carpeted floor surface for mounting the lower ends of the wall panels elevated above said floor surface to provide with said floor channel a longitudinal raceway for utilities at floor level, the improvement which comprises said wall supporting members being provided with two horizontally spaced pairs of upwardly directed flanges to receive the lower edges of two wall panels and being also provided with a pair of horizontally spaced legs each projecting downwardly beneath a respective one of said pairs of flanges to confine said utilities within the space below said panels, the lower ends of said legs beings provided with horizontally oppositely directed lugs for snap-in locking engagement with the oppositely directed flanges of a trackway formed in said floor channel, said floor channel also being provided with downwardly directed, non-destructive, gripping means for detachable non-slipping engagement with said carpeted-floor surface.

4,080,767

BUILDING WALL WITH APPLIED FINISHING SURFACE DESIGN

William D. Wilhelm, 533 San Juan, St. Charles, Mo. 63301

Filed May 10, 1976, Ser. No. 684,733
Int. Cl.² E04C *1/00*
U.S. Cl. 52—314 **9 Claims**



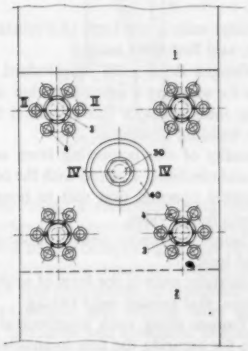
1. A building wall comprising, in combination, a plurality of individual blocks laid up in abutment and in overlying courses in a wall, said individual blocks having generally rectangular bodies separated by mortar joints and presenting individual faces in the surface of the wall, each of said individual block faces being formed with horizontally and vertically directed grooves which cooperate in the wall layup to provide with said mortar joints a matrix of grooves extending throughout the wall, and a layer of material forming a coating applied over said matrix of grooves to fully cover the same, said coating being indented to define a pattern of grooves in said coating material which is exposed to view and which follows a predetermined selection of grooves in said covered underlying matrix of grooves.

4,080,768

CONNECTING ARRANGEMENT

Georg Trixl, Zurich, Switzerland, assignor to Consecco A.G., Glarus, Switzerland

Filed Dec. 27, 1976, Ser. No. 754,792
Claims priority, application Switzerland, Apr. 21, 1976, 4969/76
Int. Cl.² E04D *1/00*
U.S. Cl. 52—521 **25 Claims**



1. A structural connecting arrangement comprising
a first structural element having a first surface, and a second surface;
a second structural element also having a first surface and a second surface;
at least one connecting member connecting said structural elements and retaining said first surfaces in mutual abut-

ment at an interface while said second surfaces face away from each other;

an annulus of discrete frustoconical projections on said first surface of said first structural element concentric to said connecting member; and

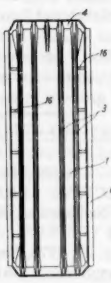
an annulus of discrete frustoconical recesses formed in said first surface of said second element also concentric to said connecting member, the projections of said first element being matingly received in the recesses of said second element so as to resist forces which are transmitted between said elements and which are substantially in the plane of said interface.

4,080,769

ANNULAR STRUCTURES FOR THE ERECTION OF BUILDINGS

Sergio Borghi, Via Trieste 35, 56100 Pisa, Italy

Filed Mar. 10, 1976, Ser. No. 665,583
Claims priority, application Italy, Mar. 10, 1975, 21093/75
Int. Cl.² E04C *1/30*
U.S. Cl. 52—582 **6 Claims**



1. In combination, for the formation of an annular building structure:

i. first modular units in the form of a substantially rectangular plate, said first units having:

a. side flanges along each longitudinal edge to receive means for securing a unit to another similar unit,

b. a plane internal major face to bound the internal space of the building structure,

c. a plurality of ribs projecting from an external major face, said ribs being adapted with the corresponding ribs of another opposed first unit to bound a plurality of channels for services,

d. end flanges to receive means for securing the unit to a second unit;

ii. second modular units in the form of a substantially rectangular plate, said second units having:

a. side flanges along each longitudinal edge to receive means for securing the unit to another similar unit,

b. a concave internal major face to bound the internal space of the building structure,

c. a plurality of ribs projecting from an external major face, said ribs being adapted with the corresponding ribs of another opposed second unit to bound a plurality of channels, for services,

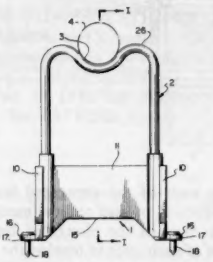
d. end flanges to receive means for securing the unit to a first unit.

4,080,770

HIGH CHAIR SPACER

Sandor Vigh, 214 Nantucket Blvd., Scarborough, Canada (M1P 2N9)

Continuation-in-part of Ser. No. 602,088, Aug. 5, 1975, abandoned. This application Mar. 17, 1977, Ser. No. 778,789
Claims priority, application Canada, Aug. 6, 1974, 206366
Int. Cl.² E04C *5/16*
U.S. Cl. 52—689 **9 Claims**



1. A high spacer chair for concrete reinforcing rods and for receipt in supporting formwork structure which comprises in combination;

a plastic base and a metal wire standoff spacer member insertably supported therein;

said metal wire member comprising a material capable of providing the predetermined strength necessary for receiving and supporting a reinforcing rod directly thereon and wherein said metal is subject to corrosion when exposed to the environment, said metal wire member being preformed to a predetermined size, having parallel oriented equilength downwardly depending legs for receipt and securing within the plastic base and an area defined on said member intermediate said legs for receipt of the reinforcing rod thereon,

said base comprising a tough plastic and including a pair of parallel planar wings with a web transversely joining the wings, said wings comprising feet at outward downwardly directed ends thereof, at least one foot of each wing portion being positively securable on said formwork structure,

a pair of substantially tubular vertically extending recesses integrally defined with said web, each recess being inwardly of a respective wing and defining a deep hole portion open at its upper end and terminating at its lower end adjacent to but spaced upwardly from a respective bottom foot, the said bottom feet and said wing feet being coplanar, each said recess securely receiving therein a respective leg of said wire member, with the lower end of each said leg abutting against the lower end of its respective hole, the lower end of each leg of said wire member thereby being spaced upwardly from the respective bottom foot, vertical thrusts in said legs of said metal wire member being transmittable directly against the lower end of the respective hole and thence directly to the respective bottom foot and thus to said formwork,

a pair of vertically extending slots defined in said base at the junction of said wing and said web,

a trestle member extending upwardly from the base including a pair of legs, and a transverse beam section,

the legs of said trestle member being receivable in said slots for locating said beam section above said reinforcing rod receiving area on said wire member,

said web ensuring mutually fixed spaced separation of the legs of the wire member, and said wire member being isolated from the effects of environmental corrosion when said spacer is present in a reinforced concrete structure, and overturning forces applied to said spacer being re-

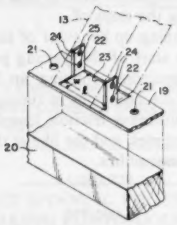
sisted by the outward separation of said wing feet from the legs of said wire member.

4,080,771

TRUSS ALIGNING SYSTEM

Victor Weller, R.R. No. 1, Lone Pine Drive, Port Sydney, Ontario, Canada

Filed Sep. 2, 1975, Ser. No. 609,711
Int. Cl.[2] E04B 7/06
U.S. Cl. 52—735 3 Claims



1. An elongated structual component adapted to be secured to the wooden frame of a building as a permanent component thereof for facilitating fixing the spacing of the structual members of said wooden frame during construction thereof, said elongated structual component consisting of relatively stiff, flat metal stock the longitudinal edges of which are continuous and in the plane of said flat metal stock, said elongated structual component having a plurality of pairs of stiff metal flanges integral therewith and spaced at modular distances along the length thereof, the flanges of each pair of flanges being arranged in spaced parallel relationship, substantially perpendicular to the plane of said elongated structual component and inwardly from the continuous elongated edges thereof, and each flange of a pair of flanges being struck up from that portion of the body of said elongated structual component between each pair of flanges thereby forming an opening in said flat metal stock between each pair of laterally spaced flanges, each flange corresponding in length to one half the length of said opening and in width to one half the width of said opening, and each flange having a plurality of apertures therein, each aperture formed at an acute angle to the plane of its respective flange to accomodate fastening means for permanently securing a wooden frame member between each of said pairs of flanges.

4,080,772

APPARATUS FOR DEPOSITING MATERIALS IN A CONTAINER

Phillip W. Chambley, and Alan H. Norris, both of Rome, Ga., assignors to Champion International Corporation, Stamford, Conn.

Filed May 6, 1977, Ser. No. 794,360
Int. Cl.[2] B65B 63/04
U.S. Cl. 53—116 12 Claims

11. An apparatus for depositing material into a container comprising:

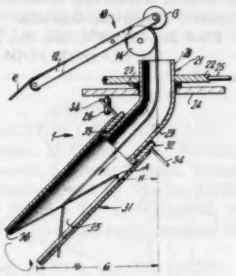
support means;

an elbow-shaped tubular member rotatably mounted within said support means, said elbow-shaped member having a substantially vertical portion and an angled portion;

a tubular sleeve member, one end thereof being rotatably mounted on the angled portion of said elbow-shaped, while the other end thereof has an assymetrical slot formed therein, said slot divergingly extending from an intermediate portion of said sleeve to the free end thereof;

means for rotating said elbow member and sleeve member about the vertical axis of said elbow member;

means for rotating said sleeve member about its longitudinal axis; and



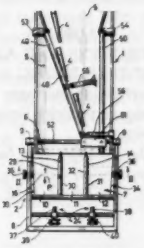
means for feeding said material through said elbow-shaped member and said sleeve member, whereby said material is delivered from various portions of the slot in said sleeve member prior to being deposited into said container.

4,080,773

APPARATUS FOR FILLING A RECEPTACLE, PARTICULARLY WITH SPINNING BOBBINS

Peter van Daalen, Hengelo (O), Netherlands, assignor to B.V. Machinefabriek M. Brouwer & Co., Hengelo (O), Netherlands

Filed Feb. 14, 1977, Ser. No. 768,144
Claims priority, application Netherlands, Feb. 24, 1976, 7601888
Int. Cl.[2] B65B 35/22
U.S. Cl. 53—142 12 Claims

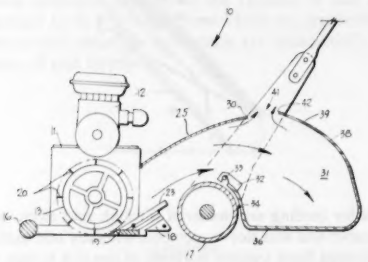


1. A device for filling a receptacle with oblong articles parallel to each other with their extremities positioned in two mutual parallel end planes comprising a feed path means for feeding the articles, directing means for transversely directing said articles on said feed path means, an elongated intermediate space operative to receive said articles from said directing means, a pull-out bottom in said elongated intermediate space operative to periodically release said oblong articles, said intermediate space having at least one upwardly movable partition subdividing said intermediate space into at least two compartments said at least one partition having a length which substantially corresponds with the longitudinal dimension of the oblong articles, said directing means being operative to supply said oblong articles to a particular compartment of the intermediate reservoir, and alternately to supply said oblong articles to another compartment.

4,080,774
MOWER

Roy George Knight, Thebarton, Australia, assignor to Scott Bonnar Limited, Thebarton, Australia

Filed Jul. 29, 1976, Ser. No. 709,767
Int. Cl.[2] A01D *53/06*
U.S. Cl. 56—199 **5 Claims**

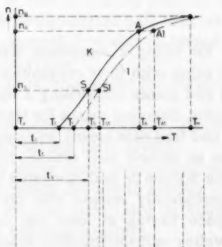


1. A lawn mower comprising a frame, a cutter reel journalled for rotation in bearings in the frame, a cutter blade fixed relative to the frame, an engine positioned above the cutter reel, a front roller parallel to and positioned forwardly of said cutter reel, a rear driving roller parallel to said cutter reel and disposed rearwardly therefrom, drive means coupling the engine to both the cutter reel and rear roller, and a catcher mounted on said frame and positioned rearwardly of the rear roller, the mower having upper and lower deflector plates, said rear roller being positioned adjacent and rearwardly of said lower deflector plate, a portion of the surface of said rear roller also being a grass deflector surface which together with said lower deflector plate form lower deflector means between the cutter blade and grass catcher, the lower deflector means being arranged to deflect grass cuttings such that they move upwardly and rearwardly from the reel, above said grass deflecting surface of the rear roller and into the catcher, the upper deflector plate being above and spaced from the lower deflector plate and rear driving roller and sloping upwardly and rearwardly, the upper deflector plate also being arranged to deflect grass cuttings into the catcher.

4,080,775
YARN PIECING PROCESS AND APPARATUS FOR AN OPEN END SPINNING ASSEMBLY

Fritz Stahlecker, Josef-Neidhartstrasse 18, 7341 Bad Uberkingen, Germany, assignor to Fritz Stahlecker and Hans Stahlecker, both of, Germany

Filed Oct. 4, 1976, Ser. No. 729,262
Claims priority, application Germany, Oct. 3, 1975, 2544209
Int. Cl.[2] D01H *1/12, 1/32*
U.S. Cl. 57—34 R **10 Claims**



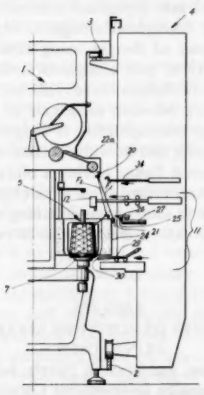
1. Process for yarn piecing in an open end spinning assembly on a spinning machine having a plurality of commonly driven spinning assemblies which can be selectively stopped and started independently of one another, where the individual steps of the yarn piecing process are controlled by a predetermined piecing program whose start is triggered as a function of the running up of a previously braked down spinning rotor, so that a yarn carried back into the spinning rotor will be applied in the spinning rotor to a fiber ring at a time during which the spinning rotor has only reached a rotational speed that is below the operating rotational speed thereof, said running up of a previously braked down spinning rotor being separately controllable for each of respective ones of said spinning assembly; said process including the steps of:

monitoring the running up behavior of the spinning rotor, and triggering the start of the piecing program in dependence on the monitored running up behavior, thereby accommodating discrepancies in running up characteristics caused by different friction losses, drive train part tolerances, downtimes, and the like at the respective individual spinning assemblies.

4,080,776
THREADING DEVICE FOR DOUBLE TWIST THREAD TWISTING FRAMES

Zdenek Hemala; Günter Nudinger, both of Kempten; Gerhard Wehrmeister, St. Mang; Reinhard Mair, Waltenhofen, and Erich Wurster, Memmingen, all of Germany, assignors to Saurer-Allma GmbH Allgauer Maschinenbau, Kempten, Germany

Filed Sep. 27, 1976, Ser. No. 727,150
Claims priority, application Germany, Oct. 4, 1975, 7531564[U]
Int. Cl.[2] D01H *15/00, 1/10*
U.S. Cl. 57—34 R **15 Claims**



1. In a threading device for double twist thread twisting frames, having a spindle and a storage disc, the improvement comprising a service carriage mounted for movement on and along at least one side of said frame, a suction device mounted on said service carriage and movable toward said storage disc, a compressed air driven threading head mounted on said service carriage and movable between a rest position remote from said spindle and a threading position in which it is in register with the upper end of said spindle, said threading head having on its side facing the spindle axis (S) an inlet slot that extends parallel to said spindle axis (S) and a thread channel adjacent the bottom of said inlet slot which in the threading position registers with said spindle axis (S), and at least two holder elements mounted on said frame and being spaced one above the other and substantially in the plane of movement of said inlet slot and between which a piece of thread (F1) to be

threaded can be supported and thereby presented to said threading head.

4,080,777

NOVELTY YARNS

Ernest J. Griset, Jr., Asheville, N.C., assignor to Akzona Incorporated, Asheville, N.C.

Filed Sep. 13, 1976, Ser. No. 722,881
Int. Cl.[2] D02G *3/34, 3/36*
U.S. Cl. 57—140 J 17 Claims

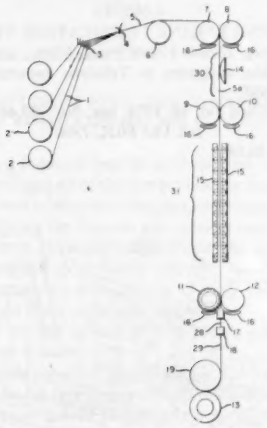
1. A novelty yarn comprising at least one beaded yarn and at least one support yarn combined along their lengths, the combined yarns being waxed.

4,080,778

DIRECT SPINNING PROCESS FOR STRETCH-BREAKING CONTINUOUS FILAMENTS TO FORM ENTANGLED YARN

Dustin Stetson Adams; Frederick C. Field, Jr., both of Wilmington, Del., and James Ronald Layton, Goodlettsville, Tenn., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 564,217, Apr. 1, 1975, abandoned. This application Oct. 6, 1976, Ser. No. 730,023
Int. Cl.[2] D02G *3/24*
U.S. Cl. 57—157 S 4 Claims



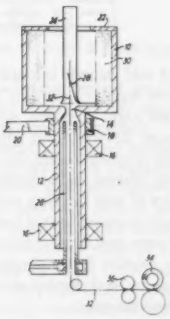
1. In a direct spinning process wherein parallel synthetic organic continuous filaments are stretch-broken and drafted between input rolls and delivery rolls in a drafting zone to form a yarn of discontinuous fibers, the improvement which comprises supplying continuous synthetic organic filaments having a break elongation of less than 70 percent to the drafting zone, stretch-breaking the filaments with an imposed draft of 5 to 100X with a vertical spacing of 65 to 130 centimeters between the input rolls and the delivery rolls in which the filaments are unsupported while avoiding accumulation of static charges on the filaments to provide discontinuous fibers having a number average fiber length of 18 to 60 centimeters, with a distribution of fiber lengths such that at least 5 percent of the fibers are no longer than 12.7 centimeters, 50 percent to 93.5 percent of the fibers are longer than 12.7 centimeters and no longer than 76 centimeters, and at least 1.5 percent of the fibers are longer than 76 centimeters, removing the fibers from the drafting zone over an apertured delivery roll with an aspirating jet and next entangling the fibers with an entangling jet to form an entangled yarn of fibers which are randomly intermingled along the length of the yarn to maintain the unity of the yarn by frictional constraint between the fibers, the yarn having an entanglement pin count of 3 to 25 millimeters and a nep count value below about 75.

4,080,779

PRODUCTION OF PLIED YARN

James Edward Freeman, 35 Gibson Ave., Norden, Rochdale; Arthur Francis Bagnall, 5 Gresham Close, Whitefield, Manchester, both of England, and by Marion McKenzie, legal representative, 20 Wingate Drive, Whitefield, Manchester, England, assignors to John McKenzie, deceased, late of Manchester, England

Filed Jul. 30, 1976, Ser. No. 710,327
Claims priority, application United Kingdom, Aug. 1, 1975, 32161/75
Int. Cl.[2] D01H *1/08;* D02G *3/38*
U.S. Cl. 57—160 1 Claim



1. In a method wherein piled yarn is produced in a pot spinning machine having a spinning pot and a traversing tube coaxial with said pot, the improvement consisting of the steps of filling the spinning pot to a predetermined capacity with yarn delivered from the traversing tube while said traversing tube is reciprocating along the axis of said pot; injecting a lead yarn by fluid jet means into said pot so that the yarn being delivered from the traversing tube is wound around said lead yarn and, drawing the lead yarn out of the pot together with yarn from said traversing tube whereby yarn in said pot is wound around yarn led from said traversing tube, said lead yarn being injected through the bottom of the pot in a direction opposite to the direction of travel of yarn into and through the traversing tube when the traversing tube is in the lower part of the pot.

4,080,780

ELECTRONIC TIME KEEPING SYSTEM

Clark R. Williams, and Robert H. Schnurr, both of Dallas, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 264,212, Jun. 19, 1972, Pat. No. 3,886,726. This application Feb. 5, 1975, Ser. No. 547,147
Int. Cl.[2] G04B *19/30;* G04C *3/00;* H03K *1/02*
U.S. Cl. 58—50 R 4 Claims

1. An electronic watch including a timekeeping circuit supplied from a voltage source of miniature batteries comprising:

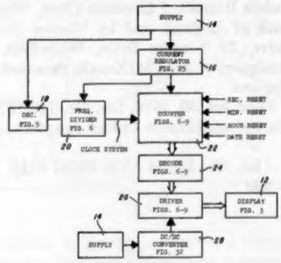
(a) electro-optical display devices for displaying hours, minutes and seconds, said display devices, said timekeeping circuit and said battery voltage source being contained within a watch case with said display device being visible from without for reading the displayed time;

(b) a frequency source providing clocking signals, said time-

keeping circuit being coupled to said frequency source and including a plurality of counter circuits responsive to said frequency source for producing time indicative output signals and decode circuits coupled to said counter circuits for converting said time indicative output signals to display coded format;

(c) a constant current regulator having an input and an outut, said regulator being connected at its input to said battery voltage source;

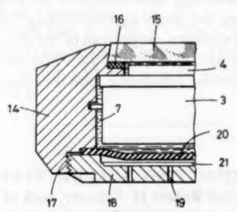
(d) a plurality of bipolar transistor current sources connected in common to the output of said regulator, said



counters and said decode circuits being implemented by current driven bipolar transistor integrated DC coupled flip flops and logic elements without load resistors or charge storage devices, said bipolar transistor current sources being coupled to said flip flop and logic elements for supplying current individually to respective ones of the transistors of said flip flop and logic elements; and

(e) driver circuits coupled to said battery voltage source and coupled between said decode circuits and said electro-optical display devices for impinging required current and voltage levels on said display elements to effect a visible display of time thereon.

4,080,781
ELECTRONIC WRIST WATCH
Hans Ulrich Klingenberg, 3274 St. Niklaus near Merzligen, Bern, Switzerland
Filed May 25, 1976, Ser. No. 689,836
Claims priority, application Switzerland, Jun. 4, 1975, 7183/75
Int. Cl.² G04C *3/00;* G04B *37/00;* B44C *1/04*
U.S. Cl. 58—90 R **8 Claims**



1. An electronic wrist watch comprising

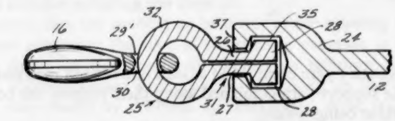
a watch case defining a portion of the exterior surface of said wrist watch and containing an interior space and at least one rigid portion,

a static electronic module integral with a static display device secured within said interior space,

means for closing said interior space in a fluid-tight manner, said means for closing including a structure defining another portion of the exterior surface of said wrist watch, module protecting liquid completely filling the remaining interior space not occupied by said electronic module and display device, and

means responsive to the expansion and contraction of said protecting liquid for varying the volume of said interior space.

4,080,782
SWIVEL FOR CARGO BINDERS AND THE LIKE
Carl Colecchio, Lake City, Mich., assignor to Lake City Manufacturing Co., Lake City, Mich.
Filed Oct. 4, 1976, Ser. No. 729,856
Int. Cl.² B21L *13/00*
U.S. Cl. 59—9 **2 Claims**



1. A method for swivel connection of forged parts comprising:

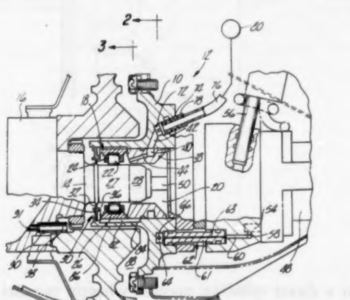
forging an open eye element having an eye portion and bifurcated shank portions with enlarged ends;

inserting said forged open eye element in a part to be connected;

closing said shank portions to close said eye by heat and pressure; and

inserting said shank and enlargement of said eye element in a swivel socket closing said socket on said shank and over said enlarged portion of said eye element.

4,080,783
TURBINE ENGINE LUBRICATION SYSTEM
Glenn Hamburg, Grosse Pointe Park, Mich., and Gytis Jasas, Toledo, Ohio, assignors to Teledyne Industries, Inc., Los Angeles, Calif.
Filed Jul. 28, 1976, Ser. No. 709,449
Int. Cl.² F02C *7/06*
U.S. Cl. 60—39.08 **10 Claims**



1. A lubrication system for a turbine for lubricating a bearing assembly within a bearing cavity, said system comprising:

a source of pressurized air;

an annular distributor contained within the bearing cavity and having inlet means comprising an annular groove in the distributor, said distributor further having outlet means comprising a plurality of substantially axial passageways, each passageway being open at one end to said annular groove and open at its other end to the bearing cavity;

first passage means for fluidly connecting said pressurized

air source with said distributor inlet means so that a fluid flow through said distributor is obtained;

a source of fuel, and

second passage means for fluidly connecting said fuel source to said first passage means, whereby an air-fuel mixture forms the fluid flow through said distributor, wherein said air-fuel mixture impinges upon said bearing assembly to lubricate the same.

4,080,784

GAS TURBINE ENGINE POWER PLANT WITH A COAL BURNING FLUIDIZED BED

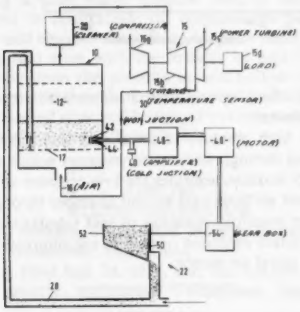
Albert Jubb, Kenilworth, England, assignor to Rolls-Royce Limited, London, England

Filed Oct. 7, 1975, Ser. No. 620,271

Claims priority, application United Kingdom, Oct. 17, 1974, 44947/74

Int. Cl.[2] F02C 9/06

U.S. Cl. 60—39.28 T 4 Claims



1. A gas turbine engine power plant comprising:

a compressor having a delivery end for discharging compressed air;

a coal burning fluidized bed for coal ash and unburnt coal;

means for supplying all of the compressed air from the delivery end of said compressor into the coal burning fluidized bed to fluidizing the coal ash and unburnt coal therein and to have direct chemical contact with the coal ash and unburnt coal and to be heated thereby;

a cleaner for receiving and cleaning all of the heated air and exhaust gases from said fluidized bed;

a compressor driving turbine in series with a power turbine which drives a load;

means for supplying all of the heated air and exhaust gases from said cleaner first to clean compressor driving turbine and then to said power turbine and from said power turbine to atmosphere;

a coal supply means connected to said fluidized bed for supplying coal suspended in compressed air to the fluidized bed;

a coal supply control means operatively connected to said coal supply means for controlling the supply of coal delivered by said coal supply means to said fluidized bed; and

a bed temperature sensing means operatively connected to said fluidized bed and to said coal supply control means, said sensing means being arranged to produce signals dependent on bed temperature to thereby selectively operate said coal supply control means in response to such signals so as to cause said coal supply means to deliver more coal to said bed when said bed temperature drops below a predetermined minimum value and to cut off delivery of coal to said bed to thereby limit bed temperature to a predetermined maximum value.

4,080,785

MODULATING BYPASS VARIABLE CYCLE TURBOFAN ENGINE

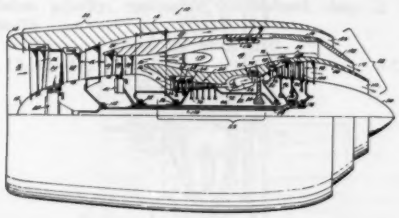
Bernard L. Koff, Cincinnati; Raymond E. Budinger, Montgomery, and James E. Johnson, Hamilton, all of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Continuation of Ser. No. 519,065, Oct. 30, 1974, abandoned, which is a division of Ser. No. 445,438, Feb. 25, 1974, abandoned.

This application May 3, 1976, Ser. No. 682,307

Int. Cl.[2] F02K 1/16, 3/06

U.S. Cl. 60—226 R 12 Claims



1. A turbofan engine comprising:

a first fan stage driven through a shaft and including first rotatable fan blades;

a second fan stage including second rotatable fan blades disposed downstream of said first fan stage and separated from the first fan stage by a first space;

a core engine for pressurizing a core stream and having a core inlet, a core compressor, a combustion chamber, a core turbine and a core shaft drivingly connecting said core compressor and said core turbine, wherein the core inlet is disposed downstream of said second fan stage and separated from said second fan stage by a second space;

a first fan duct for directing a first fan stream and having a first inlet disposed within said second space;

a second fan duct generally coannular with the first fan duct for directing a second fan stream and having a second inlet disposed within said first space;

first modulating means for varying flow through the first fan stage;

second modulating means for varying that portion of the flow passing through the first fan stage, as established by the first modulating means, which also passes through the second fan stage, the remainder of the flow passing through the first fan stage comprising the second fan stream;

fan turbine means drivingly connected to said first and second fan stages, said fan turbine means being driven entirely by the pressurized core stream;

a core exhaust nozzle for expelling the core stream into the atmosphere;

a first fan exhaust nozzle for expelling the first fan stream into the atmosphere, said first fan exhaust nozzle generally circumscribing said core nozzle; and

a second fan exhaust nozzle for expelling the second fan stream into the atmosphere, said second fan exhaust nozzle generally circumscribing said first fan exhaust nozzle.

4,080,786

HYDRODYNAMIC TORQUE CONVERTERS

Karl Gustav Åhlén, Bromma, Sweden, assignor to S.R.M. Hydromekanik, Stockholm-Vallingby, Sweden

Filed Dec. 29, 1976, Ser. No. 755,424

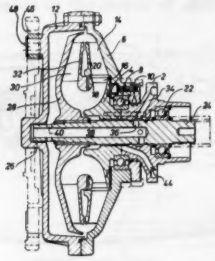
Claims priority, application United Kingdom, Dec. 31, 1975, 53376/75

Int. Cl.[2] F16D 33/00

U.S. Cl. 60—361 14 Claims

1. A hydrodynamic torque converter comprising a rotatable casing enclosing a closed circuit for circulation of a working fluid defined by a torroidal working chamber having an annu-

lar core therein, the closed circuit including in cross-section an outflow section, an inflow section and radial inner and radial outer transition regions connecting the inflow and outflow sections, a blade system located within the working chamber and including a ring of pump blades, a ring of guide blades, and a ring of turbine blades, the blades of the blade system being generally radially disposed within the working chamber in accordance with the parameters set out in the following table, in which *Ro/Ri* is the ratio of the outlet and inlet radii for the



respective rings of blades, α (alpha) is the inlet angle of the blades, β (beta) is that angle formed between a chord drawn for a blade and a radial line drawn from the centre of rotation of the system and the outermost edge of the blade, γ (gamma) is the angle subtended at the centre of rotation of the blade system by the innermost edges of two adjacent blades, δ (delta) is a measure of the curvature of the blade, and in which the radii of the outermost edges of the pump (R3) and turbine (R4) blades are at least 85% of the maximum radius of the torroidal working chamber:

TABLE

Blade	Ratio Ro/Ri		α		β	
	max	min	max	min	max	min
Guide	1.27	1.10	35°	20°	42°	25°
Pump	1.70	1.49	110°	70°	25°	10°
Turbine	0.6	0.5	35°	14°	22°	8°

Blade	γ		δ	
	max	min	max	min
Guide	15°	5°	40°	110°
Pump	20°	12°	+10°	−30°
Turbine	18°	10°	60°	100°

4,080,787

HIGH VELOCITY SPIRAL AIR MOTOR

Howard Biggs, Jr., 1014 Nesquehoning St., Easton, Pa. 18042, and Vincent Raymond Meiley, 2421 Miller Ave., Whitehall, Pa. 18052

Filed Dec. 7, 1976, Ser. No. 748,346
Int. Cl.[2] F15B *13/07*
U.S. Cl. 60—407 **8 Claims**

1. A high velocity spiral air motor comprising:

concentric, inner and outer closed cylindrical casings defining therebetween a first, high pressure air storage chamber, said inner closed cylindrical casing defining a second, low pressure air accumulator chamber,

a shaft extending coaxially through at least said inner cylindrical casing and mounted for rotation with respect thereto,

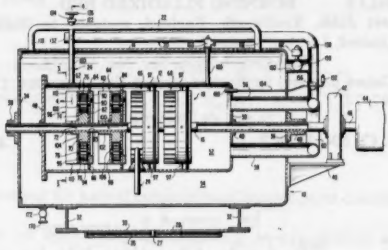
a plurality of impellers positioned within said inner casing and means for operatively connecting said impellers to said shaft at axially spaced positions,

a plurality of tubular induction nozzles fixedly mounted to said motor and projecting through said inner cylindrical casing and having open discharge ends, respectively, facing the periphery of said impellers and being spaced therefrom,

a high pressure manifold leading from said first chamber to said tubular induction nozzles upstream of the discharge ends thereof and opening to said tubular induction nozzles remote therefrom,

a low pressure manifold leading from one end of said second chamber and opening to said tubular nozzles at a point intermediate of said openings from the high pressure manifold and the discharge ends of said nozzles,

means defining a converging nozzle passage within said tubular inductor nozzles intermediate of the openings within said tubular induction nozzles from said low pressure and high pressure manifolds, and



means for charging said first chamber with air at relatively high pressure;

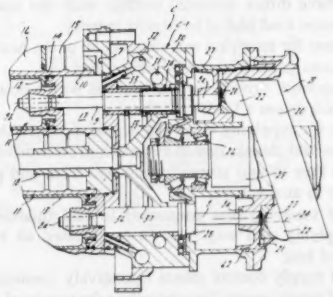
whereby, high pressure air from said first chamber in discharging through said nozzle passages within said tubular inductor nozzles, aspirates the low pressure air to recirculate spent air from said second chamber through said low pressure manifold openings of said tubular inductor nozzles to effect extended operation and improved efficiency of said spiral air motor.

4,080,788

SEPARATOR APPARATUS FOR DIFFERENTIAL HIGH PRESSURE SYSTEMS OF A STIRLING ENGINE

Don B. Kantz, Ferndale, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Jul. 6, 1976, Ser. No. 702,645
Int. Cl.[2] F02G *1/04*
U.S. Cl. 60—517 **4 Claims**



1. An assembly for dividing high pressure systems for use in a Stirling type engine having two high pressure fluid systems which must be maintained in substantially independent conditions, comprising:

(a) a gas pressure system having a closed working fluid circuit which is thermally cycled, said circuit having said fluid under a mean pressure in excess of 20 atmospheres and which means pressure varies between predetermined minimum and maximum levels,

(b) a reciprocating system for extracting work energy from

said closed working fluid circuit and having a portion effective to convert reciprocation to rotary motion,

(c) an oil lubricating system for coating said reciprocating elements with lubricant and for maintaining said reciprocating system portion bathed with a lubricant,

(d) a dividing system having wiping elements maintaining sliding contact with said reciprocating system and dividing said gas system from said lubricating system, said separation system having passages continuously bleeding a portion of the gas from said gas pressure system across at least one wiping element to use the gas pressure to create a greater wiping force and to act as a vehicle for carrying away wiped lubricant as a gas/lubricant mixture, and

(e) a separation system for separating the constituents of said mixture and for returning the separated constituents to their respective systems, said separator system comprising a gas-type chamber, means for introducing a gas oil mixture into said chamber and for withdrawing gas and oil separately from said chamber, said means having a filter to substantially separate said oil from said gas, said means also having a withdrawal port and a port valve operated in conformity with the level of separated oil, said port valve having a float valve element with a hollow interior adapted to concentrate oil condensation to a confined zone, said element also having a siphon passage communicating said zone with the exterior of said float element whereby upon the pressure in said hollow float element being greater than the pressure exterior thereof, the oil in the collected zone will be forced out into said chamber for ejection eventually through said port.

4,080,789

STEAM GENERATOR

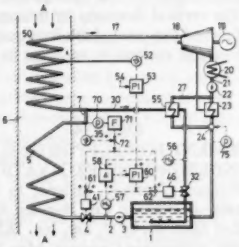
Dieter Frei, Seuzach, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Sep. 24, 1976, Ser. No. 726,068

Claims priority, application Switzerland, Sep. 26, 1975, 12551/75

Int. Cl.² F01K *3/22*

U.S. Cl. 60—658 **10 Claims**



1. A steam generator comprising

an evaporator for evaporating feed water to steam, said evaporator being disposed in a flow path of hot gas;

a feed water preheater disposed in said flow path downstream of said evaporator relative to the flow of hot gas for preheating a flow of feed water therein;

a tank containing feed water;

a feed pump connected between said tank and said preheater for pumping feed water from said tank to said preheater;

a line connected between said preheater and said evaporator for taking off heated feed water, said line being connected to said tank to deliver heated feed water thereto;

a throttling means in said line for controlling the flow of heated feed water delivered to said tank; and

control means for increasing the amount of feed water flowing through said preheater and said line in response to an increase in temperature of the feed water in said preheater and for decreasing the amount of feed water in response to a decrease in temperature of the feed water in said preheater, said control means including a temperature measuring means for measuring the temperature of the feed water passing from said preheater.

4,080,790

SAFETY SYSTEM FOR A STEAM TURBINE INSTALLATION

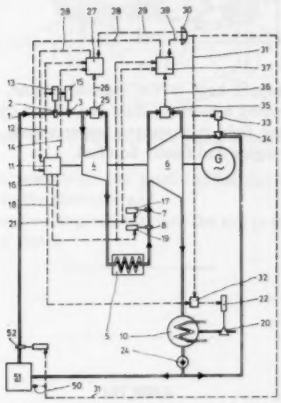
Arthur Oberle, Ennetbaden, Switzerland, assignor to BBC Brown Boveri & Company Limited, Baden, Switzerland

Filed Sep. 30, 1976, Ser. No. 728,287

Claims priority, application Switzerland, Aug. 2, 1976, 13346/76

Int. Cl.² F01K *9/00*

U.S. Cl. 60—661 **5 Claims**



1. In a safety system for a steam turbine installation which comprises a steam generator, at least one stop valve located in the steam flow path from the steam generator upstream of the turbine and at least one vacuum break valve located in the steam flow path downstream of the turbine, and a combined regulating and safety device connected to the turbine and which produces signals for controlling said stop and vacuum break valves, the improvement characterized by a combination of the following features:

a. means for monitoring steam flow downstream of said stop valve and which supplies a corresponding signal to a logic system, the value of said signal normally corresponding to the setting of said stop valve,

b. said logic system in the event of a disparity serving to trip said regulating and safety device thereupon to effect a closure of said stop valve and a partial opening of said vacuum break valve, and

c. upon detection of a further mass flow by said steam flow monitoring means after the prescribed partial vaccum has been reached, said logic system serves to move said vacuum break valve to its full open position and active means provided for protecting the turbine blading, whereas otherwise said vacuum break valve is closed again on attaining the prescribed partial vacuum.

4,080,791

FUEL CELL POWER GENERATING STATIONS

Murray Nadler, Morris Plains, and Robert P. Cahn, Millburn, both of N.J., assignors to Exxon Research & Engineering Co., Linden, N.J.

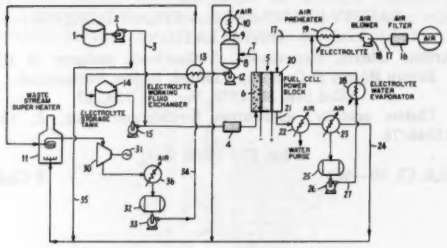
Filed Jan. 3, 1977, Ser. No. 756,183

Int. Cl.² F01K *27/00*; H01M *8/04*

U.S. Cl. 60—670 **9 Claims**

1. An integrated power generating plant comprising a fuel cell for partially reacting a fuel to directly generate electrical

energy and to produce a partially reacted fuel effluent; and an auxiliary electrical generating system including an electric generator and a thermal engine for driving an electric generator; means for completely combusting the partially reacted fuel



effluent to supply heat to the thermal engine, said thermal engine employing a working fluid in a closed cycle in which liquid working fluid is vaporized, super-heated, expanded in the thermal engine and finally liquified.

4,080,792

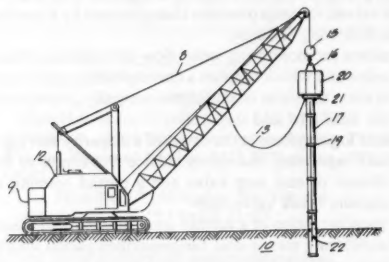
SOIL COMPACTION SYSTEM

Lowell M. Anderson, Huntsville, Ala., and William D. Simmons, 1216 Seventh St., Long Beach, Mich. 39560, assignors to William D. Simmons, Long Beach, Miss., a part interest

Continuation of Ser. No. 24,207, Mar. 31, 1970, abandoned. This application Jun. 20, 1977, Ser. No. 808,300

Int. Cl.[2] E02F *1/00*

U.S. Cl. 61—35 **17 Claims**



1. A method of compacting an area of soil comprising the steps of:

a. orienting an elongated probe formed from a thin-walled member having a substantially uniform cross-sectional shape perpendicular to its longitudinal axis in a position which is substantially perpendicular to said soil;

b. inserting said probe into said soil while continuously vibrating said probe, whereby said probe is driven into said soil and said soil is compacted;

c. withdrawing said probe from said soil while continuously vibrating said probe, whereby said probe is extracted from said soil and said soil is compacted; and

d. repeating steps (a), (b), and (c) at a plurality of locations over said area.

4,080,793

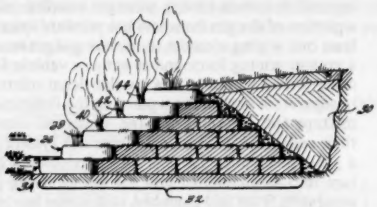
METHOD AND APPARATUS FOR USING AUTOMOTIVE TIRES AS EARTH ENGINEERING DEVICES

Ernest K. Pulsifer, P.O. Box 772, Easton, Md. 21601

Filed Apr. 10, 1975, Ser. No. 566,822

Int. Cl.[2] E02B *3/12*

U.S. Cl. 61—37 **26 Claims**



1. An earth engineering apparatus comprising:

a plurality of vehicular tire casings arranged in a plurality of planar arrays extending in a substantially horizontal dimension, said planar arrays being layered on top of one another in a substantially vertical dimension whereby each of said casings is in contacting relationship with at least one other casing within its respective planar array and with at least one other casing within an adjacent layered planar array;

means for interconnecting said casings in both the vertical and horizontal dimensions, said interconnecting means comprising pins projecting through apertures provided in mating deformations of the casings at said contacting locations;

said mating deformations including an inwardly directed deformation of one casing and a mating outwardly directed deformation of an adjacent contacting casing; and

each of said pins including a shank portion and a hook portion, said casings being interconnected in the horizontal dimension by said shank portions projecting through said mating deformations of the casings and being interconnected in the vertical direction by interengagement of the hook portions of the pins which interconnect in the horizontal dimension casings in adjacent layered planar arrays.

4,080,794

ARRANGEMENT FOR SUPPORTING ROOFS OF UNDERGROUND EXCAVATIONS

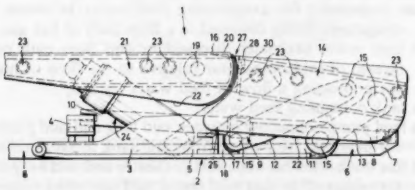
Gustav Neu, Bochum, Germany, assignor to Bochumer Eisenhutte Heintzmann GmbH & Co., Bochum, Germany

Filed Mar. 31, 1977, Ser. No. 783,338

Claims priority, application Germany, May 21, 1976, 2622888

Int. Cl.[2] E02D *15/44*

U.S. Cl. 61—45 D **7 Claims**



1. In an arrangement for supporting roofs of underground excavations, a combination comprising a support adapted to engage the floor of an underground excavation; a movable roof shield for engaging the roof of the underground excavation; a movable rear shield mounted on said support and pivotally connected with said roof shield for relative movement thereto

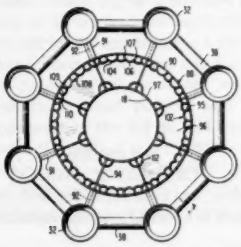
about a pivot axis; means arranged between said support and each of said shields for moving said shields independently from and relative to each other between a plurality of inclined positions in which said shields are inclined at different angles of inclination relative to each other; and cooperating means respectively fixed to said roof shield and said rear shield for limiting movement of said shields beyond a predetermined one of said inclined positions in which said shields are inclined with a predetermined angle of inclination relative to each other.

4,080,795

METHODS AND APPARATUS FOR APPLYING BUOYANT FORCES TO OFFSHORE TOWER LEGS AND PROVIDING AND ENCLOSING BUOYANCY CHAMBERS

Jay B. Weidler, Jr., Houston, Tex., assignor to Brown & Root, Inc., Houston, Tex.

Division of Ser. No. 610,277, Sep. 4, 1975, Pat. No. 4,014,176.
This application Jan. 13, 1977, Ser. No. 759,090
Int. Cl.² E02B *17/00*; B63C *35/44*
U.S. Cl. 61—88 **1 Claim**



1. A buoyancy chamber comprising:
an enclosed chamber including
shell means defining an outer chamber wall; and
a plurality of curved segments having a cross-sectional extent of less than a full pipe,
said curved segments being disposed in edge-overlapping relation and bonded to one side of said shell means to define a double-walled buoyancy chamber wall means;
said double-walled buoyancy chamber wall means, as defined by said edge-overlapping curved segments including
continuous outer wall means,
continuous inner wall means, and
spaced web means extending transversely between said inner and outer, continuous wall means;
said double-walled buoyancy chamber wall means defining at least a portion of said outer chamber wall and including a series of contiguous enclosures extending along said one side of said shell means.

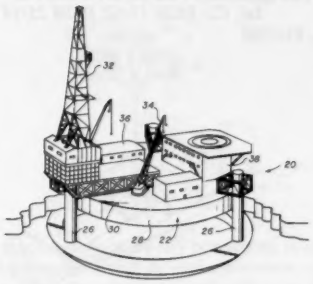
4,080,796

BOTTOM-SUPPORTED VESSEL FOR PERFORMING SUBAQUEOUS OPERATIONS AND METHOD OF PLACING A BOTTOM-SUPPORTED VESSEL IN POSITION FOR PERFORMING SUBAQUEOUS OPERATIONS

Porter Russell Edling, Houston, and Gerhard Helmut Reusswig, Conroe, both of Tex., assignors to The Offshore Company, Houston, Tex.

Filed Apr. 30, 1976, Ser. No. 682,068
Int. Cl.² E02D *21/00*
U.S. Cl. 61—88 **3 Claims**

1. A bottom-supported vessel from which subaqueous operations may be performed, comprising:
a circular platform including a buoyant cylindrical hull and a circular deck mounted on the top of the hull from which subaqueous operations may be performed;
a ring-shaped floatable mat;
the outside diameter of the platform and the inside diameter of the mat being such that the hull may nest within the mat when the vessel is in its floating mode;
means for ballasting and deballasting the mat;



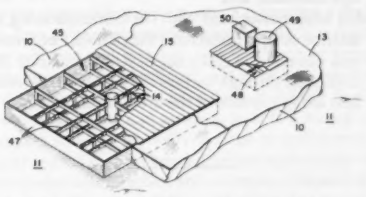
legs attached to the mat and extending upwardly from the mat;
means associated with the platform for moving the legs relative to the platform; and
means for embedding said mat into the soil at the bottom of a body of water.

4,080,797

ARTIFICIAL ICE PAD FOR OPERATING IN A FRIGID ENVIRONMENT

Gene D. Thompson, Denver, Tex., assignor to Exxon Production Research Company, Houston, Tex.

Filed Jul. 30, 1976, Ser. No. 709,974
Int. Cl.² E02D *27/00*
U.S. Cl. 61—103 **38 Claims**

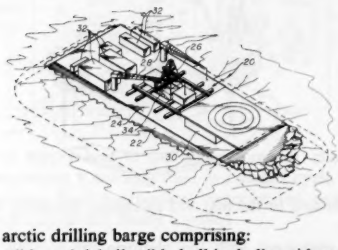


1. A method for constructing an ice pad on land in an arctic environment comprising:
selecting a predetermined area of said land on which to locate said ice pad;
building a container wall to contain water adjacent the periphery of said predetermined area;
flooding said area within said container wall with water and allowing said water to freeze;
further flooding said area until an operating surface has been formed;
installing a caisson in said ice pad extending from said surface into the ground underlying the ice pad, said caisson having upper and lower parts, said upper part extending from said surface to said ground level and said lower part extending from said ground level to below said ground level.

4,080,798
ARCTIC DRILLING BASE

Gerhard Helmut Reusswig, Conroe; James Dee Bozeman, and Don Reagan Ray, both of Houston, all of Tex., assignors to The Offshore Company, Houston, Tex.

Continuation of Ser. No. 682,066, Apr. 30, 1976, abandoned.
This application Feb. 18, 1977, Ser. No. 770,239
Int. Cl.[2] E02B *17/02*; B63B *25/16*
U.S. Cl. 61—103 3 Claims



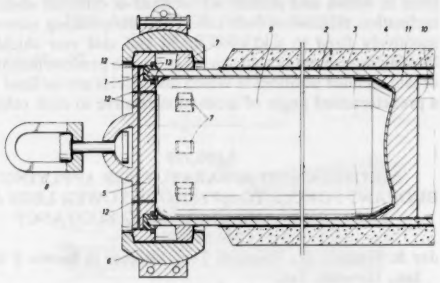
1. An arctic drilling barge comprising:
a ballastible and deballastible hull including side walls and a bottom;
a deck on top of said hull;
the hull being shaped in the form of an upright frustrum in which the angle of inclination of the sidewalls of the hull with respect to the water line is between 25° and 45°;
a plurality of hull compartments within said hull adjacent the inside of the sidewalls, the hull compartments comprising a plurality of inclined, vertically oriented forced convection channels within the hull adjacent the inside of the sidewalls;
at least one interior compartment within the hull for receiving and storing fluid;
communicating means between each of the plurality of forced convection channels and the interior compartments for transporting fluid therebetween;
circulating pump means for pumping the fluid through the communicating means between the interior compartments and the plurality of forced convection channels;
heat source means for heating the circulating fluid prior to the time it is pumped into the plurality of forced convection channels; and
valve means associated with the communicating means, the interior compartments and the plurality of forced convection channels whereby the heated circulating fluid can be circulated through various of the forced convection channels along the hull of the arctic drilling barge.

4,080,799
MECHANICAL PIPE END SEAL/ALIGNMENT DEVICE

Walter C. Nanny, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Dec. 27, 1976, Ser. No. 754,142
Int. Cl.[2] F16L *1/00*
U.S. Cl. 61—110 3 Claims

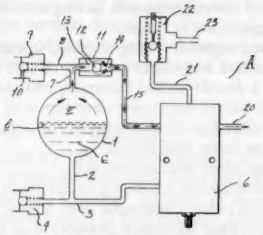
1. A method for joining a pipe segment to an offshore pipeline while maintaining pressure in the pipeline to protect it from buckling stresses arising from external pressure and bending, and to protect the joining environment, comprising:
maintaining pressure in the pipeline by sealing it with an expandable insert;
joining the pipe segment to the pipeline; and transporting the expandable insert through and to the free end of the joined pipe segment by overcoming the sliding friction resistance of the expandable insert by relatively adjusting the pressure exerted by the expandable insert and the pressure inside the pipeline.



4,080,800
CRYOGENIC CIRCUIT

Roy H. Spaulding, and Fred P. Snyder, both of St. Louis County, Mo., assignors to Essex Cryogenics Industries, Inc., St. Louis, Mo.

Filed Jan. 19, 1976, Ser. No. 650,166
Int. Cl.[2] F17C *7/02*
U.S. Cl. 62—51 10 Claims

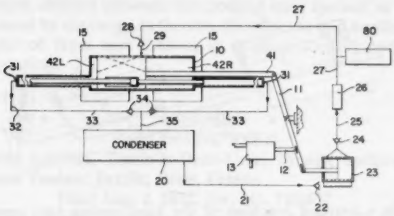


1. A cryogenic system comprising means defining a tank for receiving a fluid having a liquid phase and a vapor phase, a flow control body, means connecting the liquid side of said tank with a first inlet in said flow control body, means connecting the vapor side of said tank with a second inlet in said flow control body, said flow control body having a single outlet, there being a passage within said flow control body connecting said outlet with said second inlet, said body having a liquid flow path between said first and second inlets and said passage, said liquid flow path including a chamber, and fluid-pressure responsive valve means disposed in said chamber for controlling flow within said liquid flow path, said fluid-responsive pressure valve means comprising an annular valve seat disposed in said chamber, a ball valve disposable upon said seat, a valve stem disposed in said chamber and having an upper end projectable upwardly through said valve seat and engageable with the under portion of said valve ball, and first resilient means provided in said control body operatively engaging said valve stem for urging said ball from its seat to permit liquid flow through said chamber and said passage to said outlet.

4,080,801
ENGINE HEATED COMPRESSED DRIVE FOR VEHICLE AIR CONDITIONER

Gerhard K. Post, Pawcatuck, Conn., assignor to The Raymond Lee Organization, Inc., New York, N.Y.

Filed Oct. 19, 1976, Ser. No. 733,798
Int. Cl.[2] F25B *27/02;* B60H *3/04;* F25B *1/00;* F04B *17/00*
U.S. Cl. 62—238 5 Claims



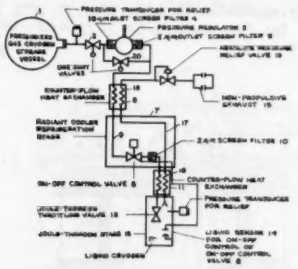
1. An engine adaptable for powering the compressor of an air conditioner system, which engine is powered by the heat of an exhaust manifold of an internal combustion engine,

said engine powered by the expansion of a fluid pressurized by a pump that is intermittently led into a cylinder chamber against a piston slidably mounted in said cylinder chamber, with the exhaust port of said chamber led through a condensor to the pump, said pump driven by said engine, with the walls of said cylinder enclosed by an exhaust manifold of said internal combustion engine, such that heat from said exhaust manifold causes the fluid in the cylinder chamber to vaporize and expand so as to drive the piston.

4,080,802
HYBRID GAS CRYOGENIC COOLER

Richard V. Annable, Fort Wayne, Ind., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Jul. 14, 1976, Ser. No. 705,219
Int. Cl.[2] F25B *19/00*
U.S. Cl. 62—514 JT 23 Claims



1. A hybrid gas cryogenic cooler comprising:

at least a first stage including

a pressurized gas cryogenic storage vessel,

a pressure regulator coupled to said vessel,

a first counter-flow heat exchanger coupled to said regulator, and

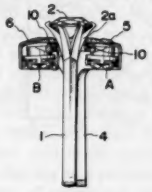
a radiant cooler refrigerator stage coupled to said first heat exchanger; and at least a second stage including

a Joule-Thomson cooler stage coupled to said refrigeration stage.

4,080,803
JEWELRY ARTICLE WITH SELECTIVELY VISIBLE PORTIONS

Fukutaro Suzuki, 3-28-8, Arakawa, Arakawa-ku, Tokyo, Japan

Filed Jul. 19, 1976, Ser. No. 706,565
Int. Cl.[2] A44C *9/00*
U.S. Cl. 63—15.4 10 Claims



1. A multipurpose article of jewelry comprising, in combination, a decorative body having an exposed surface, a hidden surface facing oppositely to said exposed surface, an aperture which opens on said exposed surface, and a depression which communicates with said aperture and opens on said hidden surface; a plurality of gem-carrying elements having various gems; and means for so connecting at least two of said gem-carrying elements to said decorative body that at least one gem carried by a selected one of said gem-carrying elements is interchangeably accommodated in said aperture of said decorative body to be visible at said exposed surface thereof, including at least two pivots offset from one another and each mounting a respective one of said gem-carrying elements on said decorative body for pivoting between an extended position in which said gem of said respective gem-carrying element is accommodated in said aperture, and a retracted position in which said respective gem-carrying element is received in said depression.

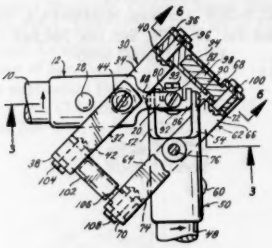
4,080,804
HIGH DEFLECTION CONSTANT SPEED UNIVERSAL JOINT

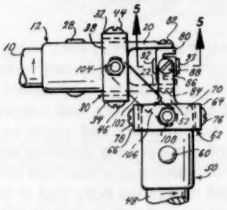
James B. Falk, 3 Lake James Ct., Florissant, Mo. 63034

Filed Apr. 19, 1976, Ser. No. 678,447
Int. Cl.[2] F16D *3/30*
U.S. Cl. 64—21 15 Claims

1. A torque-transmitting system which comprises a first end member, a first torque-transmitting support which is pivotally secured to said first end member, said first support being directed transversely of the axis of said first end member, a second end member which can have the axis thereof displaced from the axis of said first end member, a second torque-transmitting support which is pivotally secured to said second end member, said second support being directed transversely of the axis of said second end member, and a torque-transmitting link pivotally secured to both said first and said second supports, said first support rotating circumferentially with and also oscillating relative to said first end member during rotation of said first end member, said torque-transmitting link responding to said circumferential rotation and to said oscillation of said first support to cause said second support to rotate circumferentially and to oscillate, said second support causing said second end member to rotate as said second support rotates circumferentially and oscillates, said torque-transmitting link moving through 360° during each revolution of said first end member, said torque-transmitting link including at least two elements that are relatively reciprocable to permit said torque-transmitting link to have different overall lengths but said torque-transmitting link being dimensioned so it occupies only a small portion of said 360° at any instant, said torque-transmitting link having an axis, and said torque-transmitting link having rigidi-

fying means at one end thereof directed transversely of said axis of said torque-transmitting link to rigidify said torque-





transmitting link and thereby substantially prevent torsional deformation of said torque-transmitting link.

4,080,805

CAM SYSTEM FOR CIRCULAR KNITTING MACHINES

Emilio Llovet Ricart, Roger de Flor Street 16, Mataro, Spain

Filed Dec. 11, 1975, Ser. No. 639,816
Claims priority, application Spain, Dec. 17, 1974, 433.010
Int. Cl.[2] D04B *15/32*
U.S. Cl. 66—57 **5 Claims**

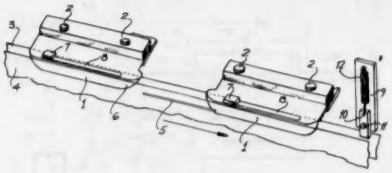
1. An arrangement in the dial cam systems for circular knitting machines comprising fixed cam means; movable cam means having variable positions for changing stitch length and cooperating with said fixed cam means to define a needle running path, said movable cam means having a configuration conforming to respective tracks substantially slightly curved and free of substantial angular projections so that the tracks are substantially straight paths for the needles, said movable cam means cooperating in different working positions to maintain the needle path parallel during the entire track and independent of the variable position of said movable cam means for increasing the speed of the dial against breakage and while reducing the number of cam systems and increasing the yield of the knitting machine.

4,080,806

KNITTING MACHINE

James C. O'Sullivan, Sutton; Patrick J. McAvoy, and Glynn B. Jeffery, both of Dublin, all of Ireland, assignors to Institute for Industrial Research and Standards, Dublin, Ireland

Filed Feb. 3, 1977, Ser. No. 765,310
Int. Cl.[2] D04B *7/04*
U.S. Cl. 66—64 **13 Claims**



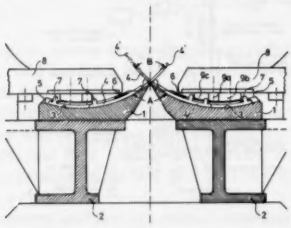
1. In a knitting machine of the kind having two opposed arrays of latched needles arranged in respective flat needle beds and means for actuating the needles of the arrays independently in succession, the actuating means being borne by a carriage mounted above and movable back and forth longitudinally along the needle beds, the improvement comprising an elongated restraining element extending longitudinally between the needle beds, a housing for the restraining element also extending longitudinally between the needle beds, both the housing and the restraining element being borne by the carriage for movement therewith, the element and the housing being relatively movable longitudinally of the needle beds whereby the element can be brought to an operative position projecting from the housing or to an inoperative position retracted in the housing, and actuator means for causing the restraining element to be in its operative position during carriage motion in one direction and for causing the restraining element to be in its inoperative position during carriage motion in the opposite direction, wherein when the element is in its operative position it extends from the trailing end of the housing into an active knitting field to hold down the loops on rising needles thereof.

4,080,807

NEEDLE BED ASSEMBLY INCORPORATING ARCUATELY SHAPED NEEDLES

Hans Maisel, Timesstrasse 5, D-8581 Mistelbach, Germany

Filed Mar. 21, 1977, Ser. No. 779,651
Claims priority, application Germany, Mar. 27, 1976, 2613179
Int. Cl.[2] D04B *23/04, 23/02*
U.S. Cl. 66—115 **5 Claims**



4. A needle and needle bed assembly for flat and circular knitting machines for making right-right and left-left knitted articles comprising:

a pair of horizontally-disposed needle beds, each of which has a generally concavely-shaped upper surface having formed therein a plurality of transversly-extending, generally arcuately-shaped grooves, with the grooves of one bed being transversly offset in relation to the grooves of

the other bed, said beds being disposed adjacent one another and positioned at the same horizontal plane;

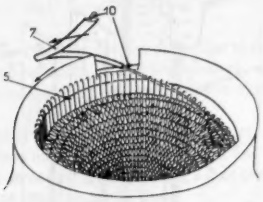
a plurality of generally arcuately-shaped needles, each of which is slidably supported within one of the grooves of each of said beds for movement between a push-out position and a drawing-in position in which positions the needles mounted on said one bed cross between the needles mounted on said other bed, said needles being guided in said beds such that the angle of the end of the needle back, defined between the crossing ends thereof, as measured by the tangents thereto, decreases as said needles are moved from said drawing-in position to said push-out position.

4,080,808

PNEUMATIC FEED

Maurice Laurent, Tassin-la-Demi-Lune, France, assignor to Rhone Poulenc Textile, Paris, France

Filed Aug. 2, 1976, Ser. No. 710,657
Claims priority, application France, Aug. 4, 1975, 75 24463
Int. Cl.[2] D04B *15/48*
U.S. Cl. 66—125 R **3 Claims**



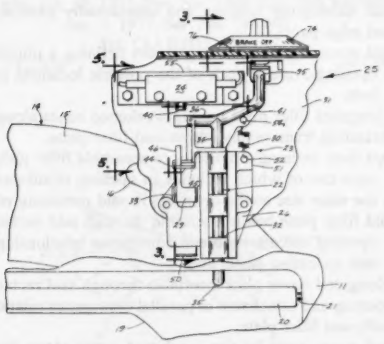
1. In a method of knitting at high speeds at least one yarn into a knitted fabric in which at least one yarn is fed to the needles in the gathering zone of a knitting machine by a current of fluid under pressure the improvement comprising directing the current of fluid tangentially across the needle stems to feed the yarn tangentially with respect to the stems of the needles in the gathering zone.

4,080,809

CASTER BRAKE CONTROL SYSTEM

Frank E. Ross, Newton, Iowa, assignor to The Maytag Company, Newton, Iowa

Filed Jun. 9, 1977, Ser. No. 804,872
Int. Cl.[2] D06F *39/00*
U.S. Cl. 68—12 R **13 Claims**



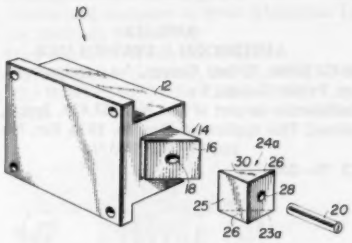
1. A caster brake control system for a portable apparatus having a plurality of electrical components operable through a series of operations wherein said apparatus includes cabinet means and an access door on said cabinet means movable between a closed position and an open position, the combination comprising: switch means operable between a first condition for deenergizing said apparatus and a second condition for effectively energizing said apparatus; a plurality of casters secured to said cabinet means and including a wheel for engaging a supporting surface; brake means associated with at least one of said casters for effectively locking said wheel against rolling action; a brake control operably connected to said brake means and movable between a brake-disengaged position and a brake-engaged position; and linkage means associated with said access door, said switch means, and said brake control and operable for actuating said switch means from said first condition to said second condition when said brake control is in said brake-engaged position and said access door is in said closed position, said linkage means being inoperable for actuating said switch means from said first condition to said second condition when said brake control is in said brake-disengaged position whereby said portable apparatus is operable through said series of operations only when said brake means is in said brake-engaged position and said access door is in said closed position.

4,080,810

RIMLATCH TO DEADBOLT LOCK CONVERTER ACCESSORY

Sherman S. Fishman, P.O. Box 321, San Francisco, Calif. 94101

Filed Apr. 10, 1975, Ser. No. 566,772
Int. Cl.[2] E05B *17/00*
U.S. Cl. 70—129 **6 Claims**



1. The combination for forming a deadbolt lock comprising a latch having a sliding bolt, said sliding bolt having an end face deposed at an angle to the axis of the bolt and a block in the form of a right prism having bases which are right triangles, the acute angles of which are approximately 45° and means affixed to said prism for securing the face of the prism opposite the right angles of the bases to the end face of the bolt to thereby convert the bolt to one having an end face disposed perpendicularly to the axes of the bolt.

4,080,811

LOCKING DEVICES FOR ELECTRIC METER BOXES

Anker J. Nielsen, Jr., 410 Bailey Rd., Holden, Mass. 01520

Filed Feb. 23, 1976, Ser. No. 660,400
Int. Cl.[2] B65D *55/14*
U.S. Cl. 70—164 **4 Claims**

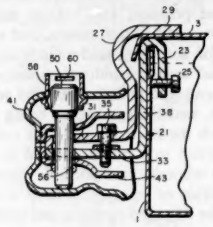
1. A lock device capable of lockingly interconnecting a lid and a body of an electric meter box, said lock device comprising

a metal bracket having an elongated central portion with one end bent so as to form a U-shape with the adjacent part of the elongated central portion, and a second end which extends away from a plane defined by said elongated central portion and in a direction opposite to the bent direction of said one end;

means for retaining the U-shaped section of said metal bracket on an edge of the body of the electric meter box;

a metal clamp having an elongated central portion positioned adjacent to said elongated central portion of said metal bracket with a first limb bent away from a plane

defined by the elongated central portion of the same side thereof as the bend of said one end of said metal bracket, and a second limb which extends away from the plane defined by the central portion and in a direction opposite to the bent direction of said first limb, said first limb being capable of retaining an edge of the lid of the electric meter box between itself and said metal bracket;



means for rigidly interconnecting said second limb of said metal clamp to said second end of said metal bracket;

a housing means for enclosing said second limb, said second end and said means for rigidly interconnecting said second limb and said second end; and

means for locking said housing means to said second limb and said second end.

4,080,812

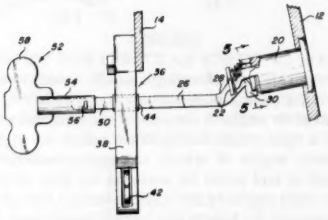
AUTOMOBILE TRUNK LOCK

Joseph C. Knott, Prince George, Va., assignor to Helen H. Knott, Prince George, Va.

Continuation-in-part of Ser. No. 583,429, Jun. 3, 1975, abandoned. This application Dec. 14, 1976, Ser. No. 750,377

Int. Cl.[2] E05B *65/12*

U.S. Cl. 70—256 **4 Claims**



1. A locking mechanism for an automobile trunk lid having a brace member, a latch mechanism provided with a latch release supported by the brace member and a latch holder mounted on the automobile chassis for operative engagement with the latch release, the locking mechanism including:

(a) a lock housing fixedly mounted on the trunk lid

(b) a cylinder lock rotatably mounted partially within said lock housing

(c) said cylinder lock being provided with a slotted portion interiorly of the lock

(d) said slotted portion of the cylinder lock being provided with a transversely cut away section

(e) a release arm

(f) one end of said release arm being operatively engaged with the latch release of the latch mechanism for tripping the former to open the trunk lid, upon rotation of the release arm through an arc of approximately 90° about its longitudinal axis

(g) the opposite end of said release arm being of hook shape

(h) said hook shape portion of the release arm extending into the transversely cut away section of said slotted portion

(i) key means for actuating said cylinder lock exteriorly of the trunk lid by rotating the cylinder lock relative to the lock housing and effecting a corresponding rotation of said release arm by virtue of the engagement of the hook end of the release arm thereof by that part of the slotted portion adjacent the transversely cut away section, and

(j) means connected with said one end of said release arm for rotating said release arm in an arc about its longitudinal axis relative to said cylinder lock while the latter is stationary, to trip the latch release and open the trunk lid.

4,080,813

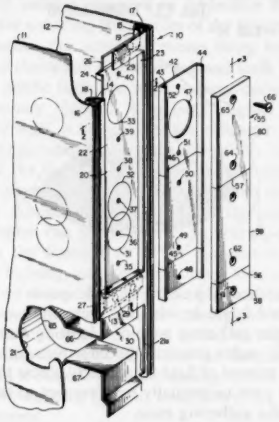
BOLT LOCK AND LOCKSET ADAPTER ASSEMBLY

H. Smith McKann, Fredericksburg, Va., assignor to General Products Company Incorporated, Fredericksburg, Va.

Filed Apr. 26, 1977, Ser. No. 790,891

Int. Cl.[2] E05B *9/08*

U.S. Cl. 70—450 **11 Claims**



1. An adapter assembly for use in combination with a hollow door of the type having vertical inner and outer panels and an edge panel, the edge panel having a rectangular opening therein to accommodate a bolt extendable from a lock through the edge panel in any one of a plurality of possible vertical locations relative to a horizontal reference plane through said door, the adapter assembly comprising the combination of

a mounting plate fixedly attached to said door inwardly of said rectangular opening and substantially parallel with said edge panel,

said mounting plate having means defining a plurality of openings, one at each of the possible locations for the bolt,

an elongated filler plate having weakened zones along lines extending transversely across said filler plate,

said lines defining a plurality of separable filler plate portions one of which includes an opening of substantially the same size as the openings in said mounting plate,

said filler plate being insertable through said rectangular opening and attachable in contiguous relationship with said mounting plate; and

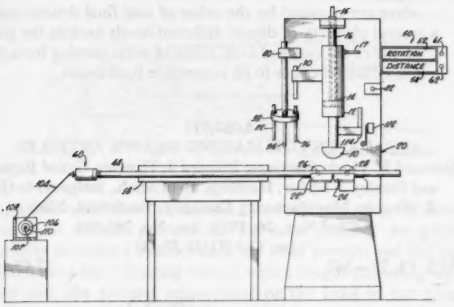
an elongated cover plate insertable through said rectangular opening and attachable in parallel contiguous relationship with said filler plate,

said cover plate having weakened zones along lines extending transversely across said cover plate, said lines defining a plurality of separable cover plate portions any combination of which can be attached to said filler and mounting plates to conceal portions thereof not having a selected one of the possible bolt locations.

4,080,814
SET-UP GUIDE FOR BENDING MACHINE

Homer L. Eaton, Balboa, Calif., assignor to Eaton-Leonard Corporation, Santa Ana, Calif.

Filed Oct. 21, 1976, Ser. No. 734,398
Int. Cl.[2] B21C *51/00*
U.S. Cl. 72—32 17 Claims



1. For use in a machine for bending pipe that is manually rotated and longitudinally shifted for bending, apparatus for indicating longitudinal and rotational position of the pipe comprising,

a fitting adapted to be connected to a pipe to be bent, first sensing means mounted upon said fitting and independent of machine structure for generating a first electrical signal indicative of rotation of the pipe,

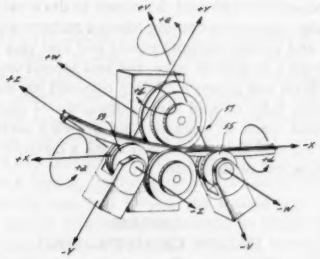
second sensing means connected with said fitting for generating a second electrical signal indicative of longitudinal position of the pipe, and

means responsive to said first and second signals for displaying values indicative of pipe rotation and pipe longitudinal position.

4,080,815
PINCH AND FORMING ROLL ASSEMBLY FOR NUMERICALLY CONTROLLED CONTOUR FORMING MACHINES

Gene B. Foster, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Continuation-in-part of Ser. No. 584,776, Jun. 9, 1975, abandoned, which is a continuation of Ser. No. 525,584, Nov. 20, 1974, Pat. No. 3,906,765, which is a continuation-in-part of Ser. No. 383,374, Jul. 27, 1973, Pat. No. 3,854,215. This application Jan. 3, 1977, Ser. No. 756,359
Int. Cl.[2] B21D *7/08*
U.S. Cl. 72—168 32 Claims



22. In a pinch and roll forming assembly suitable for contour forming parts by changing the position of one or more forming rolls with respect to the position of a pair of rotatable pinch rolls adapted to impinge on opposite sides of, and thereby move, the part to be contour formed past said one or more forming rolls, the improvement comprising:

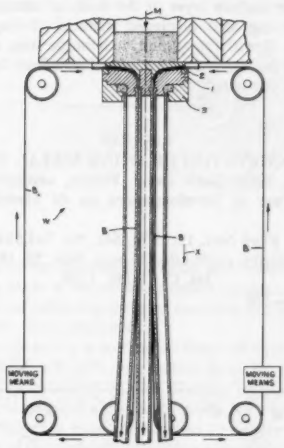
moving means for moving one of said pair of pinch rolls laterally with respect to the other of said pair of pinch rolls whereby the distance between said pair of pinch rolls is made variable; and,

forming the adjacent peripheral regions of said pair of pinch rolls such that an orifice is formed between said pair of pinch rolls, said orifice having an axis inclined to said axis of rotation of said pinch rolls and formed such that the size of said orifice perpendicular to said inclined axis changes as said moving means moves said at least one pinch roll toward or away from the other of said pair of pinch rolls, the inclination of said orifice being such that the angle a leg of a part lying generally parallel to the axes of rotation of said pinch rolls makes with a leg lying generally orthogonal to said axes of rotation will change as said part moves through said orifice and said movable pinch roll is moved toward said other pinch roll.

4,080,816
PROCESS AND DEVICE FOR MANUFACTURING EXTRUDED SECTIONS AND SIMILAR ITEMS WHICH ARE MADE IN PARTICULAR OUT OF LIGHT WEIGHT METAL

Adolf Ames, Hilzingen, Germany, and Jean-Jacques Theler, Neunkirch, Switzerland, assignors to Swiss Aluminium Ltd., Neuhausen am Rheinfall, Switzerland

Filed Jul. 8, 1975, Ser. No. 594,034
Claims priority, application Germany, Jul. 17, 1974, 2434299
Int. Cl.[2] B21C *23/04, 23/14, 25/04, 35/00*
U.S. Cl. 72—253 R 8 Claims



1. In an extrusion device for manufacturing extruded metal sections by extrusion of a stream of metal, and including a die plate defining a single die hole;

the improvement comprising

at least one substantially flat and smooth metal band positioned to divide said die hole into sectors, whereby several extruded metal sections can be formed at one time one in each sector;

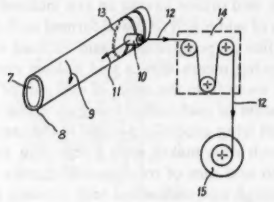
guide means operable to guide said metal band through said die hole; and

moving means operable to move said metal band through said die hole in the direction of the extrusion of the metal, at a speed independently variable with respect to the speed of extrusion of the metal.

4,080,817
PROCESS AND A DEVICE FOR THE EXTRUSION OF MATERIALS IN THE FORM OF NARROW WIRES

Maurice Bastide, 5 Bis, rue due Cantal F., Argenteuil, France (95100)

Filed Mar. 26, 1976, Ser. No. 670,845
Int. Cl.[2] B21C *3/00, 23/00, 33/00*
U.S. Cl. 72—253 R 12 Claims



1. In a process for extruding a material in the form of very fine gauge wire by the forced passage of the extrusion material through the orifice of a die, the improvement comprising

providing a tool having said die therein, a smooth face upstream from said die, and a projection means immediately downstream from said die to penetrate the material to be extruded and to push it back into the die,

advancing a body of extrusion material in front of the die to create and maintain a localized mechanical pressure from said projection means on the surface of the body of material immediately upstream of and in the vicinity of the die orifice, and thereby causing by said localized pressure the high-pressure displacement of the extrusion material lying on the surface of the body immediately upstream of the die orifice,

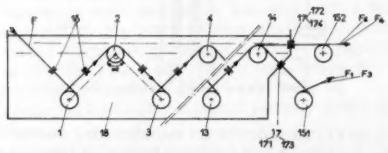
regularly and exclusively removing said displaced material from the surface layer of the body of extrusion material and forcing said displaced material through said die, thereby directly supplying, in a single step, a continuous wire of the desired gauge and of indefinite length, and

collecting the wire.

4,080,818
MACHINE FOR DRAWING METAL WIRE

Michel Gre, Saint Genis Laval, France, assignor to Sodetal-Societe Pour le Developpement du fil Metallique, Paris, France

Filed Nov. 12, 1976, Ser. No. 741,518
Claims priority, application France, Nov. 25, 1975, 75 36264
Int. Cl.[2] B21C *1/04*
U.S. Cl. 72—278 3 Claims



1. A system for drawing a plurality of metal wires including

a plurality of common drums having parallel axes,

each common drum having a plurality of tracks at least equal to the number of wires to be drawn,

said common drums being positioned in staggered relationship in two parallel rows at two different levels,

said common drums each engaging each of said plurality of wires and defining a staggered path for said wires from a first common drum to a last common drum,

a first plurality of dies each positioned to engage one of said wires in its path between successive common drums,

a pair of final drums adjacent said last common drum, said final rollers being positioned at different levels and equidistant from said last common drum, said final drums each having

a number of tracks thereon, the total number of tracks of both final drums being at least equal to the number of wires to be drawn,

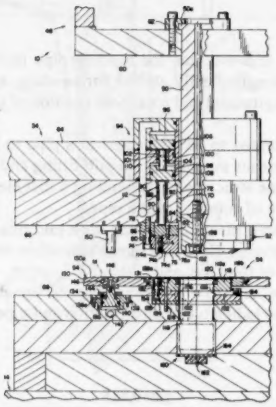
the tracks of the final drums being aligned in the paths of alternate series of wires, whereby odd-numbered wires are engaged by one of said final drums while even-numbered wires are engaged by the other of said final drums, and

a second plurality of dies at different levels each in the path of one of the odd and even series of wires passing from the last common drum to its respective final drum.

4,080,819
APPARATUS FOR MAKING DRAWN ARTICLES

Bernard K. Hook, Hastings; Richard J. Heniser, Grand Rapids, and Stanley J. Miller, Hastings, all of Mich., assignors to Gulf & Western Manufacturing Company, Southfield, Mich.

Filed Nov. 26, 1976, Ser. No. 745,291
Int. Cl.[2] B21D *22/00*
U.S. Cl. 72—347 17 Claims



1. Apparatus for forming an article from a sheet having a thickness comprising, first support means, first cutter means fixed on said first support means against movement relative thereto, draw pad means separate from said first cutter means and mounted on said first support means for reciprocating movement relative thereto and to said first cutter means, second support means, die means and second cutter means on said second support means, said first and second cutter means being opposed and cooperable to sever a blank from said sheet, said draw pad means and die means having opposed drawing surfaces respectively engaging opposite sides of said blank, ram means cooperable with said die means to draw said blank to a drawn shape, means for causing relative reciprocation between said first and second support means and said ram means, said blank having a peripheral edge, and said second support means and said draw pad means including opposed pin means engaging opposite sides of said sheet outwardly of said peripheral edge of said blank to maintain said drawing surfaces spaced apart during said drawing of said blank a distance determined by the thickness of said sheet.

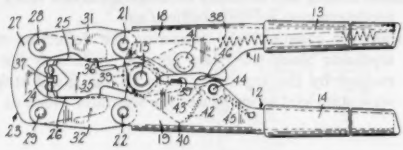
4,080,820
IN-LINE CRIMPING TOOL

Irving Allen, Westbrook, Conn., assignor to Walter Kidde & Company, Inc., Clifton, N.J.

Filed Sep. 2, 1976, Ser. No. 719,962
Int. Cl.[2] B21D *37/12*
U.S. Cl. 72—410 1 Claim

1. A crimping tool comprising two arms pivotally connected

adjacent one end, a die holder having a head portion and one side leg portion and a working surface extending toward the edge of the tool opposite said leg portion, the die holder having parallel spaced guide surfaces and the head portion having a die, links pivotally connecting each end of the head portion to each of the arms, respectively, the links being pivotally connected to the arms at points laterally offset from the arm pivot in a direction substantially perpendicular to the length of the



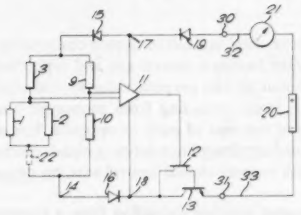
arms, and a ram fixed to the arm pivot and extending between the guide surfaces toward the die head portion, the guide surfaces defining a slot between the head portion and the leg portion and the ram being formed with a tongue extending into said slot, the pivoted connections of the links to the arms including pivot pins and the ram edges being disposed in positions to contact said pivot pins to limit the tool opening movement.

4,080,821

ELECTRIC CIRCUITS

James Stewart Johnston, Bognor Regis, England, assignor to Rosemount Engineering Company Limited, Bognor Regis, England

Filed Mar. 28, 1977, Ser. No. 781,764
Int. Cl.² G01F 1/68
U.S. Cl. 73—27 R **15 Claims**



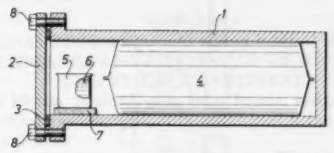
1. An electric circuit responsive to changes in the rate of heat loss from a resistance thermometer sensor, the circuit comprising a bridge circuit having first and second arms connected in parallel, the first arm comprising a first resistance thermometer sensor and second and third resistance thermometer sensors connected in parallel with each other and connected at a first balance point in series with said first resistance thermometer sensor, the three resistance thermometer sensors having closely matched values, the second arm comprising first and second resistances connected in series at a second balance point, and a differential amplifier having its inputs connected between the first and second balance points and having its output connected to control current flow in the bridge circuit, the arrangement being such that the differential amplifier is operative to balance the bridge circuit with a finite current flowing in said resistance thermometer sensors.

4,080,822

LEAK TESTING

Erik Åk Stråbäck, Nykoping, Sweden, assignor to Aktiebolaget Atomenergi, Stockholm, Sweden

Filed Apr. 30, 1976, Ser. No. 682,132
Claims priority, application Sweden, May 14, 1975, 7505556
Int. Cl.² G01M 3/20
U.S. Cl. 73—40.7 **7 Claims**



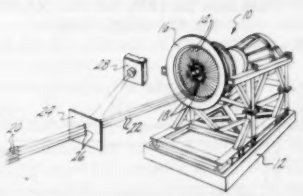
1. A method of leak testing a sealable container, in particular a transport vessel for radioactive material, comprising introducing into the container to be tested, a test gas and a pressurizing gas in condensed form, which at the testing temperature is in the vapor state, thereafter sealing the container, and when a pressurized test gas atmosphere has been obtained within the container, searching the outside of the container for the presence of test gas escaping through possible leaks.

4,080,823

VIBRATION MEASUREMENT

Hans Stargardter, Bloomfield, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Nov. 5, 1976, Ser. No. 739,391
Int. Cl.² G01H 1/00
U.S. Cl. 73—655 **14 Claims**



1. Apparatus for measuring torsional and bending deflection in a rotating blade of an operating rotary machine, comprising:
a plurality of reflecting surfaces spaced along the surface of the blade to be measured;
means for directing a collimated beam of light energy into the path of each reflecting surface so as to be reflected by each of said surfaces at each machine revolution; and
a display screen spaced from the blade for intercepting the beams reflected from the surfaces to display a composite pattern of the multiple reflections which is representative of torsional and bending deflection along the surface of the blade.

4,080,824

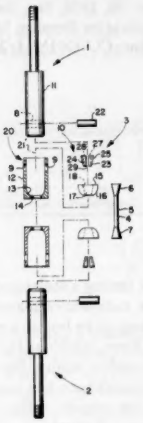
TEST SPECIMEN GRIP ASSEMBLY

Emmett A. Starks, 988 Chatham Pl., Rocky River, Ohio 44116

Filed Oct. 13, 1976, Ser. No. 732,015
Int. Cl.² G01N 3/04
U.S. Cl. 73—103 **18 Claims**

1. An assembly for holding a test specimen in a test apparatus operative to apply a tensile force or the like to the specimen generally along an axis, comprising holder means for connecting an end portion of the specimen to the apparatus, said holder means including a body connectable to the test apparatus, a

hemispherical seat in said body generally circumscribing such axis, and a hemispherical ring movably positioned on said hemispherical seat, said ring having an angularly tapered seat



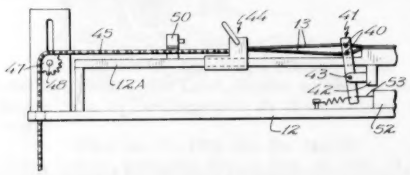
with respect to such axis, and plural insert means movably positioned on said angularly tapered seat for gripping the specimen end portion with an applied radial force that increases with an increase in the applied tensile force.

4,080,825

GLUE BOND TESTER

Allan L. Liebrenz, St. Paul, Minn.; Verne D. O'Keefe, Roberts, Wis., and Richard V. Soderberg, St. Paul, Minn., assignors to Champion International Corporation, Stamford, Conn.

Filed Nov. 22, 1976, Ser. No. 743,609
Int. Cl.[2] G01N *19/04*
U.S. Cl. 73—150 A **4 Claims**



1. Apparatus for testing the strength of glued joints between elongated strips of sheet material such as paperboard, said strips of paperboard positioned horizontally and parallel in face-to-face relationship in said apparatus, said apparatus comprising:

a horizontal base supporting said strips;

movable clamp block means positioned on said base for gripping a first end of each of said strips and holding them together;

means for uniformly applying a predetermined amount of adhesive to an upwardly facing surface of the lower to two said strips, said means setting a bond between the material strips at a predetermined temperature by applying the adhesive and being moved away from said movable clamp block means to a position at the opposite end of said strips;

means for applying heat at a predetermined temperature and pressure to said strips, said means for applying pressure including a pressure plate moved into position against that portion of said strips to which said adhesive has been applied;

a separator block pivotally mounted on said base;

a pair of spaced, parallel rotatable separating rods disposed on said separator block and positioned between said strips with a different one of said strips contacting each of said rotatable rods, one of said rods being disposed above the glue line of the adhered strips, and the other rod being disposed below the glue line of the adhered strips;

means for advancing said clamp block means and said strips at a predetermined rate of movement such that said strips are forced apart, after they have been adhered, as they pass over and under said separating rods;

means biasing said pivotally mounted separator block into a predetermined normal position; and

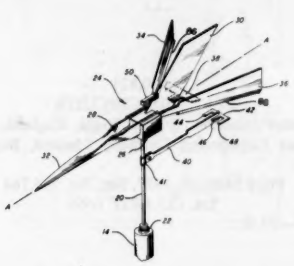
means for quantitatively measuring the deflection of said separator block from said normal position as the force exerted by the separating rods on the glued strips for separating said strips causes the separator block to pivot.

4,080,826

APPARENT WIND INDICATION DEVICE

Michael L. Perretta, 4896 Fayetteville Manlius Rd., Manlius, N.Y. 13104

Filed Mar. 4, 1977, Ser. No. 774,525
Int. Cl.[2] G01W *1/00*
U.S. Cl. 73—188 **10 Claims**



1. An apparent wind indication device comprising:

(a) a wind vane having a central axis and supported for free rotation about an axis perpendicular to said central axis;

(b) a pair of struts extending from supported positions on said vane at one end of each to opposite, free ends, said struts extending along lines defining equal, predetermined angles with respect to said central axis, on opposite sides thereof;

(c) an elongated member extending from a supported position at one end to an opposite, free end, said wind vane and said member being relatively arranged so that a line through said ends of said member lies in a common vertical plane with a line through said ends of one of said struts at some point in the rotational movement of said wind vane;

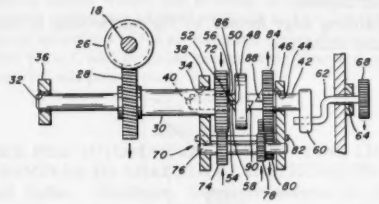
(d) both of said member and said struts being movable about axes through said supported ends thereof perpendicular to the plane of rotation of said central axis; and

(e) means providing a predetermined biasing force opposing movement of said member and struts away from predetermined, normal positions thereof, said predetermined biasing force being of such magnitude that wind force exerted on lateral surfaces of said member and struts produces movement about said axes through said supported ends of both said member and struts at high wind velocities, of only said struts at moderate wind velocities and of neither at low wind velocities.

4,080,827
UNIDIRECTIONAL INDEX DRIVE FOR GAS METERS

John L. Esola, Falls Creek, Pa., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Dec. 20, 1976, Ser. No. 752,676
Int. Cl.[2] G01F *15/00*
U.S. Cl. 73—275 7 Claims

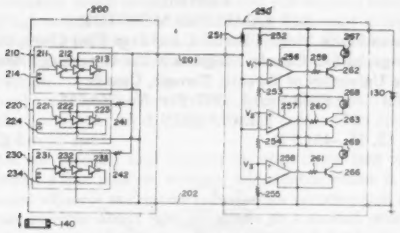


1. In a diaphragm type gas meter, coupling means connected between rotating means responsive to gas flow and the index of the meter comprising, a pair of drive cams driven in opposite directions by said rotating means, a pair of driven cams, a driven cam carrier having opposed faces carrying said driven cams on said faces, respectively, a driven shaft, said cam carrier coupled to said driven shaft for rotating said driven shaft and slidable along said driven shaft for selective engagement of one of said driven cams with one of said drive cams depending upon the direction of flow through the meter, whereby said driven shaft drives said meter index in one direction only.

4,080,828
LIQUID LEVEL DETECTING APPARATUS

Sigeyuki Akita, Aichi, and Shuzo Yoshida, Chiryu, both of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Mar. 17, 1977, Ser. No. 778,583
Claims priority, application Japan, Apr. 21, 1976, 51-45993; Apr. 21, 1976, 51-45994
Int. Cl.[2] G01F *23/26*
U.S. Cl. 73—308 5 Claims

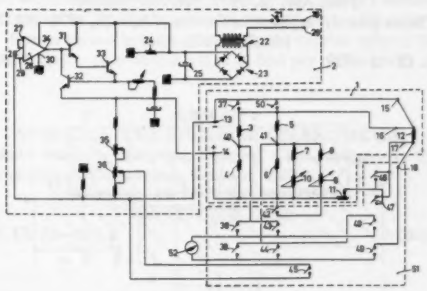


1. A liquid level detecting apparatus comprising:
a d.c. power source;
at least one ring oscillator connected to said source and energized by a direct current therefrom for generating an oscillation signal, said ring oscillator including a coil to be placed in a liquid for varying the frequency of the oscillation signal in accordance wih a self-inductive electromotive force induced therein, and the electric power consumed by said ring oscillator corresponding to the frequency of the oscillation signal;
a float disposed around said coil for vertically moving in accordance with level changes of said liquid, said float including a metallic portion for absorbing said electromotive force only while said float is near to said coil to be magnetically coupled thereto;
a resistor connected between said power source and said ring oscillator, for generating thereacross a voltage signal proportional to the direct current flowing from the former to the latter;
comparison means connected to said resistor, for comparing said voltage signal with a predetermined value which corresponds to predetermined power consumption of said oscillator to generate an output signal when said voltage signal coincides with said predetermined value; and
indicator means connected to said comparison means, for giving an indication in response to the output signal of said comparison means.

4,080,829
APPARATUS FOR AUTOMATICALLY MEASURING THE RESISTANCE AND HEATING UP OF RESISTIVE ELECTRICAL COMPONENTS

Michel Pichon, Fontenay-sous-Bois, France, assignor to Compagnie Internationale pour l'Informatique Cii-Honeywell Bull, Paris, France

Filed Mar. 11, 1977, Ser. No. 776,615
Claims priority, application France, Mar. 17, 1976, 76 07741
Int. Cl.[2] G01K *7/24;* G05F *3/10*
U.S. Cl. 73—362 AR 3 Claims



1. Apparatus for automatically measuring the resistance and heating up of resistive electrical components comprising a bridge circuit fed by a source of DC voltage, wherein said bridge circuit comprises:
a first arm connected to the terminals of the voltage source and formed by two fixed-value resistors connected in series,
a second arm connected to the terminals of the voltage source and formed by a resistor sensitive to variations in ambient temperature which is connected in series with a combination comprising a first variable resistor connectable in parallel with a second variable resistor,
a third arm connected to the terminals of the voltage source and formed by a variable resistor connectable in series with the resistive component whose resistance and heating up are to be measured,
a voltage detector which is connectable, on the one hand, between the common points of the series resistors in the first and second arms and, on the other hand, between the common points of the series resistors in the second and third arms,
first switching means which enable the voltage detector to be connected between the common points of the resistors in the first and second arms and which enables a first level E1 of supply voltage to be applied to the bridge so that, after the said first resistor in the combination in the second arm has been adjusted, the voltage detector will indicate the difference between ambient temperature and a reference temperature,
second switching means which enable the voltage detector to be connected between the common points of the resistors in the first and second arms, which enable a second level E2 of supply voltage to be applied to the bridge, and which enable the second resistor in the combination in the second arm to be connected in parallel with the first resistor in this combination so that, after the second resistor

has been adjusted, the voltage detector will indicate the ambient temperature at the sensitive resistor,

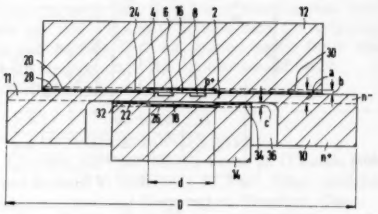
third switching means which enable the voltage detector to be connected between the common points of the series resistors in the second and third arms, which enable the variable resistor in the third arm to be connected in series with the resistance to be measured, and which enable the first voltage level E1 to be fed to the bridge, so that when the bridge is balanced, the value of the variable resistor is a multiple of the value of the resistance of the component to be measured and so that the voltage detector will then indicate the difference between the temperature of the component and the ambient temperature of the sensitive resistor.

4,080,830

PRESSURE TRANSDUCER

Paul Eckstein, Erlangen-Tennenlohe; Ottomar Jäntsch, Erlangen, and Bernd Reimann, Uttenreuth, all of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Apr. 18, 1977, Ser. No. 788,596
Claims priority, application Germany, Apr. 23, 1976, 2617731
Int. Cl.[2] G01L *9/06*
U.S. Cl. 73—719 **13 Claims**



1. In a pressure transducer with a deformation body of single-crystal semiconductor material which is provided, in a thin central region serving as a diaphragm, with a resistor arrangement thereon, the resistance change of which is a measure for the pressure, the improvement comprising:

(a) a reinforced outer region surrounding the thin region of the deformation body containing the diaphragm;

(b) a first overload take-up connected to the thin region and to the outer region of the deformation body having a surface region facing the diaphragm containing a shallow cylindrical recess serving as a pressure chamber and an overload bed;

(c) a second overload take-up disposed on the opposite flat side of the deformation body likewise containing a shallow cylindrical recess and connected to the thin region of the deformation body; and

(d) pressure canals in the portions of the surface of the overload bodies connected to the deformation body.

4,080,831

SECONDARY SAMPLING DEVICE

Hugh Hill Roberts, and Gary R. West, both of Lakeland, Fla., assignors to International Minerals & Chemical Corporation, Libertyville, Ill.

Filed Apr. 28, 1977, Ser. No. 791,914
Int. Cl.[2] G01N *1/18, 1/20*
U.S. Cl. 73—421 A **2 Claims**

1. A secondary sampling device for particulate matter, comprising a plurality of sample splitters arranged in series including a top sample splitter and a bottom sample splitter, each sample splitter, including:

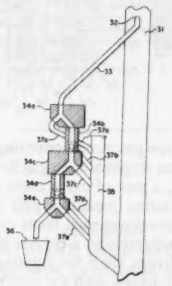
a substantially vertical inlet duct having a substantially vertical axis,

an inlet in an upper portion of said duct providing an opening to said substantially vertical inlet duct,

a first outlet duct and a second outlet duct below said inlet having substantially equal cross-sectional areas and both communicating with the inlet duct,

wherein the center axes of the inlet duct and the outlet ducts are in the same plane and intersect at the same point and the angle between the inlet duct and the first outlet duct is substantially equal to the angle between the inlet duct and the second outlet duct and is greater than about one hundred degrees,

a separating edge formed by the intersection of the two outlet ducts, and



a first outlet and a second outlet providing openings for the first outlet duct and second outlet respectively

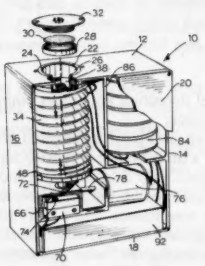
wherein particulate matter enters the secondary sampling device through the inlet of the top sample splitter, the inlet of each subsequent sample splitter joins the first outlet of the preceding sample splitter, and sample is withdrawn from the first outlet of the bottom sample splitter, and the plane of the axes of the inlet and outlet ducts of each sample splitter is substantially vertical and is substantially perpendicular to the same planes of adjacent sample splitters.

4,080,832

AIR SAMPLING MONITOR

Norman Frank Moody, Toronto, and Ivan Paul Clark, Mississauga, both of Canada, assignors to The Governing Council of the University of Toronto, Toronto, Canada

Filed Feb. 1, 1977, Ser. No. 764,592
Int. Cl.[2] G01N *1/24*
U.S. Cl. 73—421.5 R **8 Claims**



1. A portable air sampler comprising:

a housing,

an air filter mounted in an aperture in the housing and having an inlet side in communication with atmosphere to be sampled;

an air pumping means within the housing and adapted to draw a predetermined volume of air through said filter from atmosphere to be sampled;

a self-contained power pack within said housing;

driving means within the housing, actuating said air pumping means, and electrically powered by said power pack;

a timer within the housing, controlling the driving means and adapted to cause the driving means to actuate the air pumping means intermittently at preselected intervals to draw said predetermined volume of air through said air filter, the timer being electrically powered by said power pack;

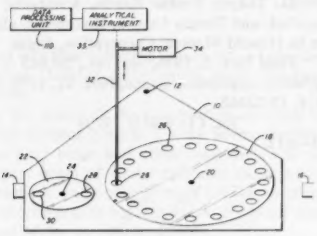
counting means within the housing, associated with said driving means and adapted to count and record the number of actuations of the air pumping means during a given time period, said counting means being electrically powered by said power pack.

4,080,833

DEVICE FOR AUTOMATICALLY SUPPLYING LIQUID SAMPLES TO ANALYTICAL INSTRUMENTS

Bernard Huber, Uberlinger, Germany, assignor to Bodenseewerk Perkin-Elmer & Co., GmbH, Uberlingen, Germany

Filed Feb. 25, 1977, Ser. No. 772,216
Int. Cl.[2] G01N *1/12*
U.S. Cl. 73—423 A **10 Claims**



1. A device for automatically supplying liquid samples to an analytical instrument comprising, in combination:

a support member in the form of a base plate mounted for pivotal movement about a pivot axis;

a sample source mounted on said support member;

a calibration vessel holder mounted on said support member which comprises a turntable having a circular array of vessels containing neutral or calibration solutions, said calibration vessel holder being movable in a stepwise manner;

an intake tube, means for vertically reciprocating said intake tube corresponding to predetermined points of an operating cycle; and

means for pivoting said support member about said pivot axis to a first position wherein said sample source is disposed adjacent said intake tube and for pivoting said support member about said pivot axis to a second position wherein one of said vessels in said vessel holder is disposed adjacent said intake tube, said pivot axis being offset with respect to the axis of rotation of said turntable and parallel thereto.

4,080,834

MEASUREMENT OF FUEL QUALITY AND ECONOMY

George A. Beauchemin, Jr., 14 Royal Cr. Dr., No. 12, Nashua, N.H. 03060

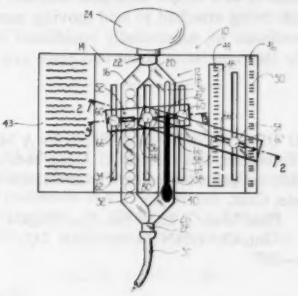
Continuation-in-part of Ser. No. 581,870, May 29, 1975, abandoned. This application May 27, 1976, Ser. No. 690,431
Int. Cl.[2] G01M *19/00*
U.S. Cl. 73—443 **12 Claims**

11. A process for determining the fuel economy comprising the following steps:

(a) obtaining a temperature reading of the fuel on a temperature scale;

(b) obtaining a specific gravity of the fuel reading on a specific gravity scale;

(c) aligning temperature and specific gravity readings to form a first nomograph giving the specific gravity of the fuel corrected to a standard predetermined temperature on a corrected specific gravity scale;



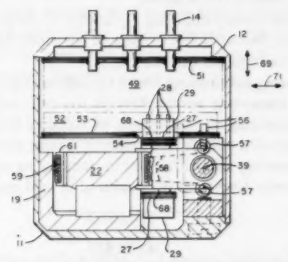
(d) aligning the value of corrected specific gravity obtained in step "*C*" with the price of the fuel on a price scale to form a second nomograph giving the caloric value of fuel per dollar on a caloric value of fuel per dollar scale.

4,080,835

SUBMINIATURE LINEAR ACCELEROMETER

Richard Donovan Marquess, Concord, Calif., assignor to Systron-Donner Corporation, Concord, Calif.

Filed Sep. 20, 1976, Ser. No. 725,046
Int. Cl.[2] G01P *15/08*
U.S. Cl. 73—517 B **3 Claims**



1. A force balance accelerometer mechanism configured to occupy minimal volume, comprising a framework, first and second bearings, means for mounting said first and second bearings in fixed relationship with said framework defining a pivot axis relative thereto, a moving member, first and second pivots attached to said moving member toward one end thereof and engaging said first and second bearings respectively, whereby said moving member is free to move pivotally relative to said framework about said pivot axis, first and second conducting planar surfaces carried by the other end of said moving member on opposite sides thereof and being oriented so that they are parallel to said pivot axis, a torque coil attached to the other end of said moving member, means mounted in said framework providing a magnetic field interacting with said torque coil to produce a torque on said moving member about said pivot axis, first and second pick-off mounting members of insulating material mounted on said framework, each having a planar face disposed in close spaced relation with said first and second planar surfaces respectively, first and second etched spiral pick-off coils formed on said planar faces of said first and second pick-off mounting members respectively, first and second flexible conducting leads having substantially equal mass extending between said one end of said moving member and said framework, first and

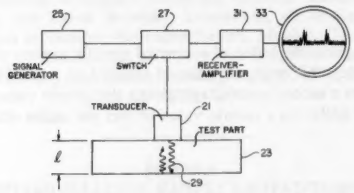
second electrical conductors connected between the ends of said first and second flexible conducting leads respectively extending to said one end of said moving member and opposite electrical ends of said torque coil, said first and second conducting leads being attached to said moving member at said one end proximate to, substantially equidistant from, and at substantially 180° separation about said pivot axis.

4,080,836

METHOD OF MEASURING STRESS IN A MATERIAL

Robert B. Thompson, and George A. Alers, both of Thousand Oaks, Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Mar. 7, 1977, Ser. No. 774,834
Int. Cl.² G01N *29/00*; G01B *7/16*
U.S. Cl. 73—597 **2 Claims**



1. A method of measuring stress in a material comprising the steps of:

a) obtaining a correlation between the difference in velocity of orthogonally polarized transverse waves in the material and stress in the material;

b) simultaneously applying a plurality of differently oriented driving forces to the surface of the material from a single electromagnetic transducer;

c) allowing said driving forces to radiate orthogonally polarized transverse waves through the material;

d) determining the difference in velocity between said orthogonally polarized transverse waves; and

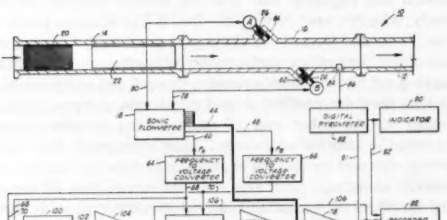
e) comparing said difference in velocity to said correlation, whereby stress can be measured in said material.

4,080,837

SONIC MEASUREMENT OF FLOW RATE AND WATER CONTENT OF OIL-WATER STREAMS

John D. Alexander, and Philip W. Reed, both of Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

Filed Dec. 3, 1976, Ser. No. 747,170
Int. Cl.² G01N *29/02*
U.S. Cl. 73—61.1 R **9 Claims**



2. Apparatus for determining the oil and water content in an oil-water mixture flowing through a closed conduit system, comprising:

a metering conduit section of known cross-sectional size inserted in said conduit system;

a fluid mixer conduit section inserted in said conduit system upstream from said metering conduit section;

means attached to said metering conduit section for determining upstream and downstream frequency of sonic energy transmitted at predetermined frequency through said flowing oil-water mixture;

means for converting the upstream and downstream frequency signals to an analog voltage indicative of average frequency which analog voltage varies in proportion to the speed of sound in the mixture; and

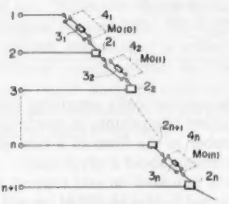
means for indicating said analog voltage relative to the calibrated limits of the speed of sound within an oil-water mixture which may vary from zero to one hundred percent water cut.

4,080,838

METHOD AND APPARATUS FOR CONTROLLING ULTRASONIC WAVES

Masao Kuroda, Tokyo; Toshio Kondo, Kunitachi; Sekijyuro Ono, Hachioji, and Toshio Ogawa, Kokubunji, all of Japan, assignors to Hitachi Medical Corporation, Japan

Filed Nov. 5, 1976, Ser. No. 739,043
Claims priority, application Japan, Nov. 12, 1975, 50-135082; Mar. 4, 1976, 51-23543
Int. Cl.² G01N *29/04*
U.S. Cl. 73—612 **4 Claims**



1. A method for controlling ultrasonic waves wherein by the use of a plurality of arrayed ultrasonic transducer elements, ultrasonic waves are transmitted or received with predetermined delay times, comprising the steps of:

quantizing said delay times by a predetermined delay time, and

delaying the ultrasonic waves by a delay time corresponding to a value of the difference of the quantized delay times between adjacent elements so as to bestow this delay time on the ultrasonic waves which are transmitted or received between said adjacent elements,

the ultrasonic waves being transmitted or received with directivity at a predetermined deflection angle.

4,080,839

TESTING METHOD USING ULTRASONIC ENERGY

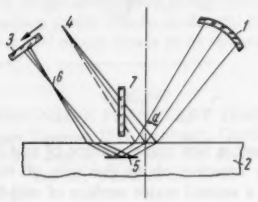
David Solomonovich Shraiber, Leninsky prospekt, 39, kv. 100; Boris Glebovich Golodaev, 9 ulitsa Sokolinoi gory, 3, kv. 253, both of Moscow; Leonid Mikhailovich Zakharov, Sovetsky prospekt, 14, kv. 31, Ivanteevka, Moskovskoi oblasti, and Anatoly Fedorovich Razumovsky, Kantemirovskaya ulitsa, 5, korpus 1, kv. 31, Moscow, all of U.S.S.R.

Continuation of Ser. No. 389,554, Aug. 20, 1973, abandoned. This application Aug. 23, 1976, Ser. No. 716,686
Int. Cl.² G01N *29/04*
U.S. Cl. 73—617 **9 Claims**

1. A method of testing a workpiece to detect flaws therein, comprising the steps of:

generating ultrasonic waves and emitting them as a convergent beam;

directing said emitted convergent beam as an incident beam onto the workpiece to be tested, said incident beam being directed towards the surface of the workpiece along a direction angularly displaced from the normal to the surface of the workpiece to provide waves reflected from the surface of the workpiece and waves reflected from flaws in the workpiece, waves of said incident beam entering said workpiece being refracted by the workpiece material and reflected from the flaws, and waves of said incident beam being reflected from the surface of the workpiece, said flaw reflected waves being spatially displaced from and time delayed from said surface reflected waves;



converting said flaw reflected waves into a reflected convergent beam carrying information about the flaws in the workpiece;

receiving the waves of the information carrying beam in a receiving element lying in a plane normal to the information carrying beam and containing the focal point of a convergent beam of waves reflected from the surface of the workpiece, and concentrating the waves of the surface reflected convergent beam at a focusing point spaced from the plane of the receiving element.

4,080,840

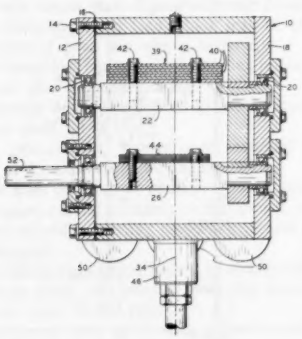
VIBRATOR DEVICE

Spencer A. Stone, Fort Wayne, Ind., assignor to The Deister Concentrator Co., Inc., Fort Wayne, Ind.

Filed Nov. 15, 1976, Ser. No. 741,739

Int. Cl.² F16H *33/00*

U.S. Cl. 74—61 **14 Claims**



1. A vibrator device, especially for vibrating screen elements, and comprising: a housing, first and second pairs of parallel shafts rotatable in said housing, and means for driving said shafts, the shafts of each pair rotating in opposite directions and the shafts of one pair of rotating at one-half the speed of the other pair, off-center weights detachably mounted on each shaft and so oriented on the respective shafts that rotation of said shafts will exert reciprocating forces on said housing in a direction parallel to a plane normal to a plane including the axes of said first pair of shafts, said weights being radially positioned in rotational alignment such that the rotation thereof define cylinders that are radially juxtaposed, the weights on said first pair of shafts, respectively, being of equal weight and the weights on said second pair of shafts, respectively, being of equal weight.

4,080,841

PUSH ELEMENT FOR TRANSMISSION BELT

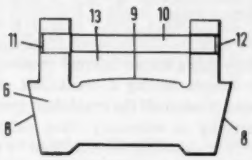
Evert Jan Vollers, Haaren (N.B.), Netherlands, assignor to Van Doorne's Transmissle B.V., Netherlands

Filed Sep. 30, 1976, Ser. No. 728,169

Claims priority, application Netherlands, Oct. 9, 1975, 7511879

Int. Cl.² F16G *51/80*

U.S. Cl. 74—236 **4 Claims**



1. A push element for a transmission belt comprising a plurality of said elements in face-to-face contacting relationship to fill the length of said belt slidably arranged on a carrier, such as one or two packets of metallic belts, the outwardly facing surface of said push element that comes into contact with the inner surface of said carrier being convexly curved in the transverse direction, said push element being made of substantially nondeformable material.

4,080,842

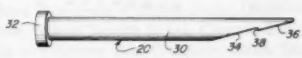
PIVOT DEVICE

James M. Lapeyre, and Fernand S. Lapeyre, both of New Orleans, La., assignors to The Laitram Corporation, New Orleans, La.

Division of Ser. No. 187,746, Oct. 8, 1971, Pat. No. 3,870,141, which is a continuation-in-part of Ser. No. 63,523, Aug. 13, 1970, abandoned. This application Jun. 10, 1974, Ser. No. 477,675

Int. Cl.² F16G *13/02*

U.S. Cl. 74—251 C **6 Claims**

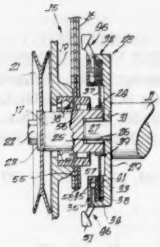


1. In a chain link conveyor comprising at least two links, the improvement comprising a pivot rod extending through said links for joining said links together so that said links are pivotal about said rods, said rod being formed of a pair of pivot pins, each of said pins including a solid substantially cylindrical shaft of substantially circular cross-section having an enlarged head portion at one end and being tapered at the other end, said tapered end being formed of a pair of bevel surfaces substantially parallel to but displaced from one another to form therebetween a ridge laterally disposed across the axis of said shaft and facing substantially toward said head portion, said pivot pins being connected so that the bevel surfaces of opposite pins are indexed and said ridge of one of said pins contacts said ridge of the opposite pin.

4,080,843
VEHICLE ACCESSORY DRIVE

Herbert N. Underwood, Chicago, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Dec. 13, 1976, Ser. No. 750,083
Int. Cl.[2] F16H 5/42
U.S. Cl. 74—336 R 13 Claims

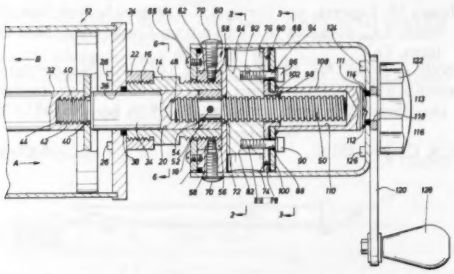


1. An accessory drive for an internal combustion engine of an automotive vehicle having a crankshaft and a camshaft rotating at a speed of one-half the crankshaft speed, comprising a stub shaft carrying an accessory drive pulley, first clutch means operatively connecting the stub shaft to the crankshaft, and second clutch means operatively connecting the stub shaft with the cam shaft only when the crankshaft speed exceeds a predetermined value.

4,080,844
MANUAL CONTROL APPARATUS

Henry R. Killian, Sugarland, Tex., assignor to Keystone International, Inc., Houston, Tex.

Filed Aug. 9, 1976, Ser. No. 712,371
Int. Cl.[2] F16H 1/18
U.S. Cl. 74—424.8 A 18 Claims



1. A selectively engageable manual drive apparatus comprising

a body having a bore therethrough,

a housing secured to said body and having an axial bore registering with said bore in said body,

rotatable split drive nut means in said housing,

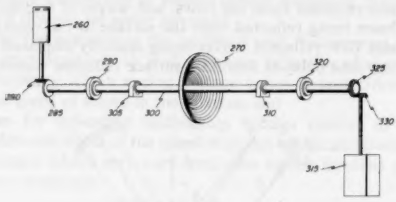
drive screw means mounted for axial movement in said registering bores in said body and said housing, and,

camming means for selectively engaging and disengaging said drive nut means and said drive screw means whereby engagement of said drive nut means and said drive screw means and rotation of said drive nut means causes axial movement of said drive screw means.

4,080,845
SHAPED DISC FLYWHEEL

Burton D. Hatch, Ballston Lake, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Sep. 17, 1976, Ser. No. 724,403
Int. Cl.[2] F16C 15/00
U.S. Cl. 74—572 39 Claims

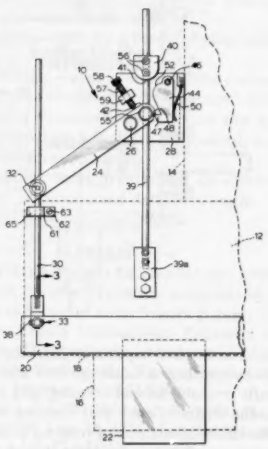


1. A flywheel, a first major surface of said flywheel being symmetrically concave about the axis of rotation of said flywheel and a second major surface of said flywheel being spaced from said first major surface and being symmetrically convex about said axis of rotation, said flywheel being of sufficient flexibility and so constructed and arranged that when rotated at a predetermined speed said flywheel assumes a generally flatter shape, such that at least significant portions of said first and second major surfaces approach positions substantially perpendicular to said axis of rotation with an accompanying increase in radius measured perpendicularly from the axis of rotation to the outer rim of the flywheel thereby circumferentially accommodating the centrifugal force acting on the flywheel and substantially eliminating any overall radial centrifugal stress within said flywheel.

4,080,846
MACHINERY GUARD

Albert J. Calhoun, Scarborough, Canada, assignor to Glentworth Manufacturing Inc., Scarborough, Canada

Filed Mar. 3, 1977, Ser. No. 773,900
Int. Cl.[2] F16P 3/04
U.S. Cl. 74—615 10 Claims



1. For use with a pressing apparatus which includes a ram member adapted to reciprocate vertically with respect to a fixed frame means,

a safety guard comprising:

shield means adjacent the ram member;

lever means pivoted to said fixed frame means,

connection means interconnecting the said lever means and the shield means such that swinging movement of the lever means in one direction raises the shield means, and swinging movement of the lever means in the other direction lowers the shield means,

contact means movable with the ram member and adapted to contact the lever means and swing the same in said one direction as the ram member descends, thereby raising the shield means,

detent means adapted to move between a first position in which it restrains the lever means against movement in said one direction and a second position in which it allows movement of the lever means in said one direction,

and displacement means which, on descent of the ram member, moves said detent means to its second position.

4,080,847

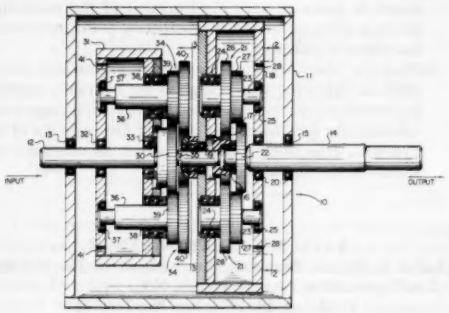
SPEED RESPONSIVE PLANETARY TRANSMISSION

William Morgan Thomas, 2517 Denmark, Garland, Tex. 75040

Filed Jun. 3, 1976, Ser. No. 692,311

Int. Cl.[2] F16H *3/74, 37/06*

U.S. Cl. 74—751 **10 Claims**



1. An automatically variable transmission comprising:

(a) a power input shaft connectible to a power source which may be liable to vary with time in speed and torque;

(b) a power output shaft aligned with said power input shaft and connectable to a load which may be liable to vary with time in speed and torque demand;

(c) said input shaft and output shaft being interconnected by a power gear train comprising:

(i) a power drive gear locked to and rotatable with said input shaft;

(ii) a gear-carrying power cage mounted for rotation about the axis of said input shaft;

(iii) at least one pair of planetary power gears coaxially mounted on and rotatable on said power cage, the first gear of said pair being meshed with said power drive gear; and

(iv) a driven power gear locked to and rotatable with said output shaft, and meshed with the second planetary power gear of said pair;

the overall speed ratio (gear ratio) of said power gear train decreasing from input to output; and

(d) a control gear train for controlling the rotation of said power cage comprising:

(i) a control drive gear locked to and rotatable with said input shaft;

(ii) a gear-carrying control cage mounted for rotation about the axis of said input shaft;

(iii) at least one pair of planetary control gears coaxially mounted on and rotatable on said control cage, the first gear of said pair being meshed with said control drive gear; and

(iv) a driven control gear locked to and rotatable with said power cage, and meshed with the second planetary control gear of said pair;

the overall speed ratio (gear ratio) of said control gear train increasing from input to output.

4,080,848

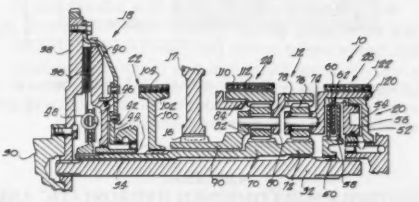
AUTOMOTIVE TRANSMISSION

Richard L. Smirl, Arlington Heights, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Continuation of Ser. No. 484,389, Jul. 1, 1974, abandoned. This application May 24, 1976, Ser. No. 689,424

Int. Cl.[2] F16H *57/10, 37/08*

U.S. Cl. 74—759 **2 Claims**



1. In a transmission mechanism; an input shaft; an output gear; a planetary gear set having a pair of input sun gear elements, an input carrier element, an output carrier element connected to said output gear, and a pair of ring gear elements; said carrier elements having pinion gears each meshing with one of said ring and sun gear elements; two of said elements comprising reaction elements for said gear set; first and second clutch mechanisms; said clutch mechanisms each having portions connected to said input shaft; said first clutch mechanism connected to said sun gears and engageable to connect said input shaft to said sun gears; said second clutch mechanism connected to said input carrier element and engageable to connect said input shaft to the said input carrier element; said output gear being located between said first clutch and said planetary gear set; said second clutch located adjacent said planetary gear set on the opposite side thereof from said output gear; one of said ring gear elements being connected to said output carrier element; a brake mechanism for said input carrier element; a brake mechanism for the other of said ring gear elements and a brake mechanism for said sun gears, whereby through selective engagement of pairs of said clutch mechanisms and pairs of said clutch and brake mechanisms, except said first clutch and sun gear brake mechanism pair and said second clutch and input carrier brake mechanism pair, a plurality of drive ratios are available through said gear set.

4,080,849

PRECISION HEAVY DUTY INDEXER

Milton Lloyd Benjamin, Chagrin Falls; David Dean Walker, Solon, and Wilbur Nelson Miles, Chagrin Falls, all of Ohio, assignors to Erickson Tool Company, Solon, Ohio

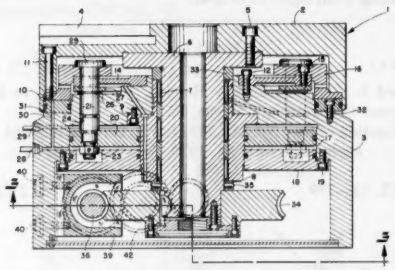
Filed Dec. 13, 1976, Ser. No. 749,799

Int. Cl.[2] B23B *29/32*

U.S. Cl. 74—813 R **10 Claims**

1. An indexer comprising a housing; an indexing member supported by said housing for rotary indexing movement; said housing and indexing member having mating annular surfaces which support said indexing member against axial load thereon in all indexed positions thereof and which constitute an axial thrust bearing during indexing of said indexing member; said housing and indexing member having interengaging gears operative to retain said member in each of its indexed positions; double acting actuating means in said housing operative to axially shift said housing gear out of engagement with and into engagement with said indexing member gear thus respectively to release said indexing member for indexing movement while

supported by said mating annular surfaces and to lock said indexing member in indexed position while forcefully pressing



said mating annular surfaces together; and drive means in said housing for imparting rotary indexing movement to said indexing member when said gears are disengaged.

4,080,850

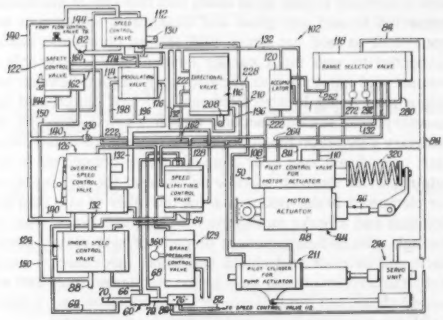
CONTROLS FOR COMBINED HYDROSTATIC AND MULTIPLE SPEED RANGE TRANSMISSION UNITS WITH AUTOMATIC SPEED CONTROL AND BRAKING FUNCTIONS

Thomas J. Bubula, Joliet; Maurice F. Franz, East Peoria; Gordon W. Johnson, Peoria, and James D. Rinaldo, Joliet, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Sep. 2, 1975, Ser. No. 609,637

Int. Cl.[2] B60K *41/00;* **F16D** *31/02;* **F16H** *47/02*

U.S. Cl. 74—861 **33 Claims**



1. A vehicular drive train for coupling a prime mover with a primary output shaft, comprising

a hydrostatic transmission unit including a hydraulically actuated translating means capable of infinitely variable displacement,

a multiple speed range transmission unit arranged in series with the hydrostatic transmission unit between the prime mover and the primary output shaft, and

a control valve assembly including

a speed control valve in communication with a source of fluid under pressure and first and second signal conduits, the speed control valve being manually operable to develop a differential pressure in the signal conduits proportional to a desired rate of speed for the vehicle,

double-acting pilot means responsive to fluid pressure for varying displacement of the translating means,

a directional control valve selectively communicating the two signal conduits with the pilot means,

a modulating valve in communication with the two signal conduits and including means for modulating fluid flow rate in each direction through one of the signal conduits in order to regulate the rate of both increasing and decreasing differential pressure between the two signal conduits corresponding to both acceleration and deceleration of the vehicle,

a range selector valve in communication with the multiple speed range transmission unit and in effective communication with the two signal conduits for shifting between speed ranges as the translating means approaches a selected limit of displacement, and

means for causing the pilot means to reset displacement of the translating means in response to shifting operation of the range selector valve.

31. In a method for synchronizing operation of a hydrostatic transmission unit including a hydraulic translating means of variable displacement and a multiple speed range transmission unit arranged in series within a drive train, the steps comprising

producing a signal to which the hydraulic translating means is responsive for varying its displacement and varying the signal in proportion to a desired rate of operation for the drive train,

modulating the signal to regulate its rate of change corresponding to both accelerating and decelerating operation of the transmission,

applying the modulated signal to the hydraulic translating means in order to vary displacement of the translating means and torque transmitting capacity of the hydrostatic transmission unit, and

shifting the multiple speed range transmission unit into a different operating speed range as the hydraulic translating means approaches a selected limit of displacement and substantially simultaneously resetting displacement of the hydraulic translating means to permit its continued response to the modulated signal.

4,080,851

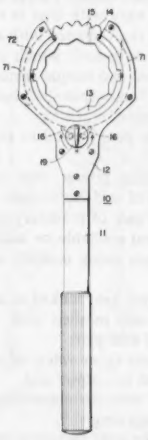
VARIABLE RACKET WRENCH

Charles E. Rogers, Barksdale, La., assignor to The Raymond Lee Organization, Inc., New York, N.Y.

Filed Apr. 19, 1977, Ser. No. 788,742

Int. Cl.[2] B25B *13/46*

U.S. Cl. 81—60 **3 Claims**



1. A rachet wrench tool fitted with a rotatable wrench assembly externally shaped, when assembled, as a continuous rachet gear,

said wrench assembly formed, when assembled, with a central opening continuously bounded by flats of a size to engage the external polygonal faces of a fastener,

said wrench assembly formed of engaged outer and inner

wrench units, each of which encompasses a circular arc of less than three hundred and sixty degrees, with

the outer wrench unit being rotatably mounted in a recess of a jaw section of the tool and the inner wrench unit being detachable from said outer wrench unit,

said jaw section being of the same profile as the outer wrench unit so that when the outer wrench unit is aligned with the jaw section, in profile, the inner wrench unit may be attached to or detached from said outer wrench unit, together with

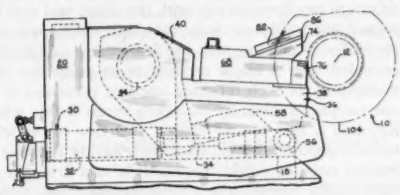
pawl means mounted in said tool to engage the rachet gear of the wrench assembly.

4,080,852

METHOD AND APPARATUS FOR MACHINING CRANKSHAFTS

Allan J. Heffron, Freeland; Henry J. Garnaat, Jackson, and Laverne H. Kennedy, Saginaw, all of Mich., assignors to CM Systems, Inc., Bay City and Crankshaft Machine Co., Jackson, both of, Mich.

Filed Mar. 7, 1977, Ser. No. 775,255
Int. Cl.[2] B23B *3/00, 5/18*
U.S. Cl. 82—1 C **10 Claims**



1. The method of machining crankshafts for internal combustion engines having a cylindrical bearing surface and radial cheek surfaces radially spaced outwardly from said bearing surface by a high speed steel bearing surface turning tool and spaced tungsten carbide cheek turning tools, respectively, wherein said tools are mounted on a common traversing tool carrier and are each selectively positionable between operative and inoperative cutting positions on the carrier, comprising the steps of rotating the crankshaft to be machined about an axis at a high speed carbide cutting speed, tranversing the tool carrier in a direction toward the rotating crankshaft perpendicular to the axis of rotation at a first rate of tool carrier movement, positioning the carbide turning tools in the operative position thereof whereby the crankshaft cheeks are machined by the carbide tools during movement of said carrier at said first rate, upon completion of the turning of the crankshaft cheeks positioning the carbide turning tools to the inoperative position and positioning the bearing surface turning tool to its operative position to machine the crankshaft bearing surface, reducing the rate of crankshaft rotation, reducing the rate of traversing of the tool carrier toward the crankshaft to a second rate less than said first rate of movement to turn and size the crankshaft bearing surface, and reversing the direction of tool carrier traversing at completion of the machining of the bearing surface to withdraw the carrier and tools from the crankshaft.

4,080,853

NUMERICALLY CONTROLLED LATHE

Yoshiaki Goto, Kasugai, Japan, assignor to Okuma Machinery Works, Ltd., Nagoya, Japan

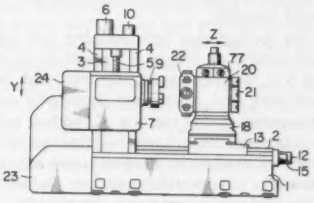
Filed Aug. 31, 1976, Ser. No. 719,191
Claims priority, application Japan, Mar. 10, 1976, 51-26267
Int. Cl.[2] B23B *3/18*
U.S. Cl. 82—2 R **6 Claims**

1. An improved numerically controlled lathe of the type having a bed, a column mounted on said bed, a headstock mounted to said column for vertical slidable movement thereon, a spindle extending from said headstock being provided with a workholding chuck, a tool post movable in a parallel and a transverse direction with respect to said spindle and pivotable on a vertical axis, said tool post being provided with opposed vertical side faces having tool turrets turnable for indexing to a horizontal axis, said tool turrets on one of said opposed vertical faces adapted to hold rotary tools and said tool turret on the other of said vertical faces adapted to hold turning tools, a numerical control unit for controlling movement of said headstock, said tool post and said tool holders and a drive means having a vertically fixed output shaft, wherein the improvement comprises:

(a) an input shaft journalled in said headstock;

(b) means within said headstock for selectively transferring rotational motion of said input shaft to rotational motion of said spindle; and

(c) rotational motion transfer means constructed and arranged to transfer rotational motion of said output shaft to rotational motion of said input shaft for all vertical positions of said headstock on said column, said means including:



(i) a support means secured to said bed;

(ii) an arm having two ends, said arm pivotably mounted at one end to said support means;

(iii) an intermediate shaft journalled in said arm at said other of two ends;

(iv) a link member pivotably secured to said input shaft and pivotably secured to said arm at said other of two ends;

(v) a first drive belt assembly operably coupling said output shaft to said intermediate shaft; and

(vi) a second drive belt assembly operably coupling said intermediate shaft to said input shaft;

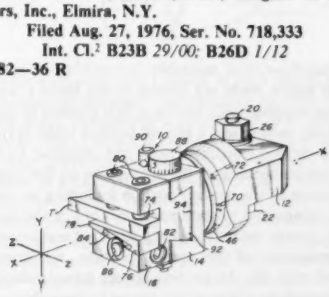
(vii) said arm pivoting about said one end coaxially of said output shaft on said support means and said link member pivoting about said other of two ends as said headstock is displaced vertically on said column to maintain each of said drive belt assemblies in an operable condition.

4,080,854

ADJUSTABLE TOOL HOLDER

Anders Adolf Peterson, Elmira, N.Y., assignor to Hardinge Brothers, Inc., Elmira, N.Y.

Filed Aug. 27, 1976, Ser. No. 718,333
Int. Cl.[2] B23B *29/00;* **B26D** *1/12*
U.S. Cl. 82—36 R **7 Claims**



1. A tool holder for use on a machine tool whereby a tool

held thereby may be adjusted along mutually perpendicular axes, said tool holder comprising:

a base member having a longitudinal X axis,

a first contact surface at one end of said base member substantially normal to said X axis, and a recess formed in said one end of said base member,

a tool holding assembly including a portion telescopically received in said recess along said X axis, said assembly including an adjustment ring threadedly engaging said portion and having a second contact surface on a radial face thereof in engagement with said first contact surface whereby rotation of said adjustment ring adjusts the relative position of said assembly and said base member along said X axis,

spring tension means for maintaining said first and second contact surfaces in substantially continual contact during adjustment of said base member and said assembly,

means limiting the relative travel between said assembly and said base member and thereby preventing disassembly of said base member and said assembly,

means for preventing relative rotation of said base member and said assembly,

means for locking said base member and said assembly against relative movement along said X axis and comprising a bolt member passing through said base member coaxial with said X axis and threadedly engaging said body member so that rotation of said bolt member varies the contact pressure between said first and second surfaces between a locked position wherein said adjustment ring is substantially immovable and an unlocked position wherein said adjustment ring is rotatable for adjusting the relative position of said base member and said assembly against said spring tension means while said first and second contact surfaces remain in substantially continuous contact,

said assembly further including a tool receiving slot and means for clamping a tool in said slot, and

means for adjusting the position of a tool in said slot along a Y axis perpendicular to said X axis.

4,080,855

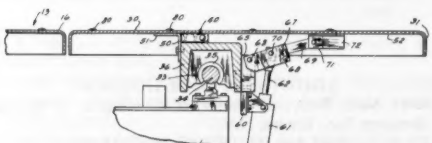
TIP TABLE WORKTABLE SECTION

Robert P. De George, Kenmore, and Paul R. Brown, Akron, both of Ohio, assignors to Houdaille Industries, Inc., Buffalo, N.Y.

Filed Sep. 2, 1976, Ser. No. 719,825

Int. Cl.[2] B26D *5/30*

U.S. Cl. 83—71 **9 Claims**



1. A machine tool assembly comprising: a tool working station at which tools are caused to act upon a workpiece, a workpiece support table having a first portion in proximity to the working section and a second portion clear of the working section, a device associated with the machine tool assembly sensing the positioning of the workpiece on the support table, a first section of the second portion including an edge thereof hingedly connected to stationary portions of the machine tool assembly, power means for tilting said first section with respect to the remainder of the second portion, and control means associated with the device and power means selectively controlling actuation of the power means in dependent response to the existence of a sensed positioning of the workpiece on the first section clear of the working station.

4,080,856

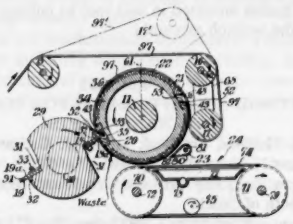
ROTARY WEB CHOPPER

Michael Hillas Shearon, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 616,055, Sep. 23, 1975, abandoned. This application May 24, 1976, Ser. No. 689,557

Int. Cl.[2] B65H *17/20*; B26D *7/06*

U.S. Cl. 83—99 **6 Claims**



1. A shear cutter for a running web comprising:

a pair of axially co-parallel counter rotating shafts power driven in synchronism one with the other; said web being trained over said first shaft, said shafts having interacting blades for cutting said web, the first shaft of said pair being provided over a major expanse of its periphery with a multiplicity of web retaining vacuum ports and at least one peripheral inwardly extending recess within which is mounted a first of said blades, said first blade being a radially disposed straight edge blade having a cutting edge located near the outside perimeter of said first shaft;

control means operating in a predetermined time sequence relative to the rotation of said shafts repetitively imposing preselected time durations for vacuum web retention;

means mounted within said recess and responsive to said control means for effecting, in seriatim, vacuum retention of the leading edge of said web during and after severance thereof, followed by means relieving said vacuum retention proximal to said leading edge following each said cut, thereby to release said leading edge; and

means stripping said leading edge at a preselected delivery point for severed sheets of said web.

4,080,857

DEVICE FOR CUTTING PIECES OF PREDETERMINED LENGTH FROM ENDLESS, STRAND-FORM MATERIAL

Paul Roth, Route de Giez, 1411, Les Tuileries-de-Grandson, Switzerland

Filed Dec. 17, 1976, Ser. No. 751,594

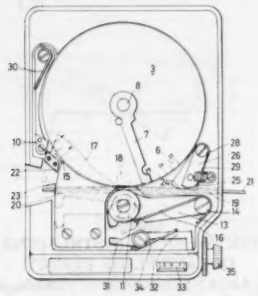
Claims priority, application Switzerland, Dec. 19, 1975, 16479/75

Int. Cl.[2] B26D *5/24*

U.S. Cl. 83—241 **12 Claims**

1. A device for cutting pieces of predetermined length from an endless wire and similar strand and strip material, comprising a circular disk (3) and a roller (11), between which disk (3) and roller (11) the wire (21) is fed, means (1) for rotating said disk (3), a lever member (13) mounting said roller (11) for free rotation and being under the influence of a spring member (16) for pressing said roller (11) towards the periphery of said disk (3) and thereby urging the wire (21) to be fed against the periphery of said disk (3) and forcibly advance between the peripheries of said disk (3) and said roller (11) in a wire feeding direction, setting means (7) secured in an adjustable position on said disk (3) for setting said predetermined length, a gear (17,18) which is forcibly driven simultaneously with the disk (3) and which acts on the lever member (13) causing it to raise the roller (11) in opposition to said spring member (16) during a portion of one rotation of said disk (3), wire guide means (19,20) disposed tangentially with respect to disk (3) for guiding the wire (21) on both sides of the space between said disk

(3) and said roller (11) in such a way that the wire (21) is only carried along by said disk (3) when said roller (11) is pressed towards the periphery of said disk (3), cutting means (22,23) at the output of said wire guide means (19,20) and being actuated simultaneously with said disk (3) in the raised position (FIG. 1) of said roller (11) for cutting said pieces of predetermined



length from said wire (21) and a spring-biased pawl (10) which holds said lever member (13) in the raised position (FIG. 1) of said roller (11) against the force of said spring member (16) and, in the course thereof, projects into the path of rotation of said setting means (7) so as to be engaged by the latter (7) and release the lever member (13).

4,080,858

CUTTING MACHINE FEED AND CLAMPING ARRANGEMENT

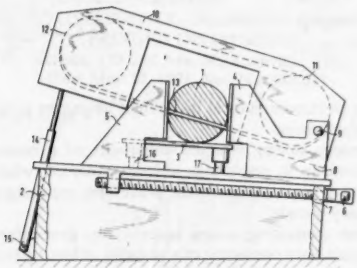
Paul Stolzer, Achern, Germany, assignor to Gesellschaft fur Schneidtechnik mit beschrankter Haftung, Achern, Germany

Filed Nov. 1, 1976, Ser. No. 737,573

Claims priority, application Germany, Oct. 31, 1975, 2548771

Int. Cl.[2] B26D *7/06*

U.S. Cl. 83—247 **24 Claims**



1. A feed and clamping arrangement for a cutting machine having a machine table for receiving material to be cut, a first pair of clamping jaws arranged at the machine table in front of a cutting plane of the cutting machine, as viewed in a feed direction of the material, the clamping jaws being guided for opening and closing in a direction transverse to the feed direction, a second pair of clamping jaws arranged upstream of the first pair of clamping jaws, as viewed in the feed direction, rollway means for substantially horizontally feeding the material to the cutting machine including a plurality of reversibly driven rollers rotatably mounted in a frame, wherein the improvement comprises:

means for mounting the second pair of clamping jaws at a forward end of the frame, as viewed in the feed direction, for movement in a direction transverse to the feed direction including a vertically extending clamping rack arranged vertically displaceable at the frame having a pair of vertical members spaced from each other so as to accommodate a maximum cross-section of the material to be cut,

one clamping jaw of the second pair of clamping jaws is fashioned as a transverse connection between said vertical members extending substantially horizontally beneath a feed plane of the material,

the other clamping jaw of said second pair of clamping jaws being mounted in parallel to the first clamping jaw of said second pair of clamping jaws so as to be vertically displaceably guided on said vertical member,

stop means for limiting downward displacement of the clamping rack relative to the frame such that the clamping jaw fashioned as the transverse connection is at a position slightly below the feed plane of the material,

means provided on at least one of an extension of the machine table and a separate machine stand for selectively guiding the frame together with the second pair of clamping jaws for movement to and fro in the feed direction, including two mutually parallel slide rods extending in a feed direction, pedestal means arranged at the machine table for mounting said slide rods at the machine table, guide block means arranged on the frame at the forward end thereof displaceable along said slide rods between said pedestal means with one of said pedestal means limiting the forward movement of the frame and and the second pair of clamping jaws, a connecting cross-piece mounted on said slide rods at a rear end of the frame, and roller means interposed between said connecting cross-piece and said frame for displaceably supporting said frame,

a stop means for limiting a return movement of the frame,

setting spindle means rotatably mounted in the pedestal means in parallel to said slide rods and operatively connected with said guide block means to selectively displace the frame and the second pair of clamping jaws, and

means for opening the second pair of clamping jaws after a cutting operation while the first pair of clamping jaws are closed and for closing said second pair of clamping jaws during a movement in the feed direction with the first pair of clamping jaws being initially opened and proceeding to close prior to a subsequent cutting operation.

4,080,859

SHEARS FOR CROPPING WIRE, MOVING AT HIGH SPEED

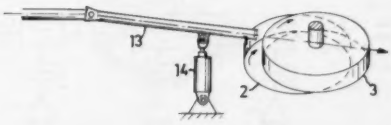
Karl-Olof Adolf Polhäll, Smedjebacken, and Arne Johnsen, Ludvika, both of Sweden, assignors to Morgardshammar Aktiebolag, Smedjebacken, Sweden

Filed Apr. 29, 1976, Ser. No. 681,569

Claims priority, application Sweden, Apr. 29, 1975, 7504972

Int. Cl.[2] B26D *1/56*

U.S. Cl. 83—306 **4 Claims**

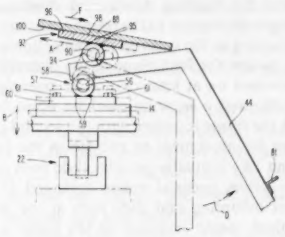


1. Shears for cropping wire running at high speed, comprising two rotating cutting bodies overlapping to shear the wire, each cutting body comprising a cylindrical disc having side surfaces at least one of which is radially disposed and a circumferential surface that interconnects said side surfaces, said discs being disposed at a ninety degree angle to each other, a small portion of said at least one radial side surface of one disc overlapping a small portion of said circumferential surface of the other said disc whereby the two discs overlap for cropping the wire, and means to move the wire and the discs relative to each other in a direction transverse to the wire thereby to move the wire toward the region of said overlapping so as to crop the wire.

4,080,860
PRESS

Francis J. McCabe, 239 Hastings Ct., Doylestown, Pa. 18901

Continuation-in-part of Ser. No. 650,926, Jan. 21, 1976, Pat. No. 4,004,480. This application Oct. 29, 1976, Ser. No. 736,823
The portion of the term of this patent subsequent to Jan. 25, 1994, has been disclaimed.
Int. Cl.² B26D 5/12
U.S. Cl. 83—530 19 Claims

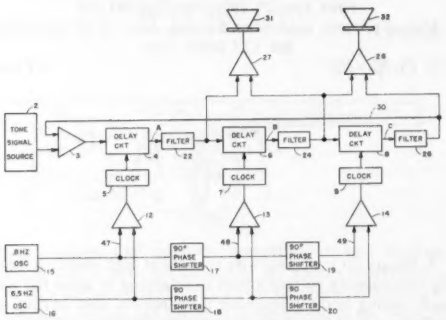


1. A press, comprising:
(a) at least one fixed portion;
(b) a plurality of movable portions, each of which portions is adapted to move reciprocally along at least one path which intersects said fixed portion;
(c) a plurality of lever means, at least one for each movable portion, each for engaging said respective movable portion to selectively cause said movable portion to move along said path intersecting said fixed portion; and
(d) an single actuating means engaging each of said lever means for exerting forces on said lever means to cause said movable portions to selectively move along their respective paths.

4,080,861
CHORUS CONTROL FOR ELECTRONIC MUSICAL INSTRUMENT

John Douglas Wholahan, Chicago, Ill., assignor to Thomas International Corporation, Chicago, Ill.

Filed Jul. 9, 1976, Ser. No. 703,753
Int. Cl.² G10H 1/04, 5/02
U.S. Cl. 84—1.24 4 Claims

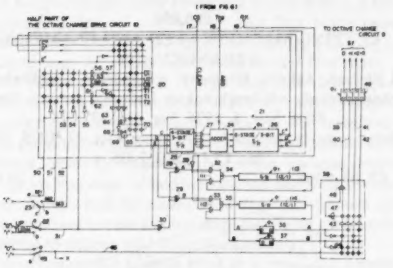


1. In an electronic musical instrument, the combination of:
a source of tone signals;
a plurality of delay circuits connected in series circuit combination and having the source of tone signals connected to the input of said combination;
circuit means for modulating each of said delay circuits with a cyclical signal at a vibrato rate;
feedback means for feeding back the output of said last series connected delay circuit to the input of the first series connected delay circuit;
means connected to the outputs of said delay circuits for electronically mixing the output signals of said delay circuits; and
sound reproducing means connected to said mixing means whereby the reproduced tone signals generate a chorus effect.

4,080,862
ELECTRONIC MUSICAL INSTRUMENT HAVING OCTAVE SLIDE EFFECT

Teruo Hiyoshi; Akira Nakada; Shigeru Yamada, all of Hamamatsu; Kiyoshi Ichikawa, Hamakita, and Shigeki Ishii, Hamamatsu, all of Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Aug. 23, 1976, Ser. No. 716,513
Claims priority, application Japan, Aug. 29, 1975, 50-104573
Int. Cl.² G10H 1/02
U.S. Cl. 84—1.24 6 Claims

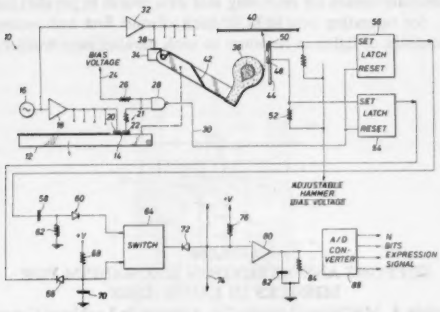


1. An electronic musical instrument having an octave slide effect, comprising:
a memory storing sampled amplitudes of a musical tone waveform at respective addresses thereof, wherein addresses for reading out the waveform are designated by binary signals;
address generating means successively generating binary signals, each consisting of a plurality of bits, by processing frequency information corresponding to a key code for reading out said waveform sampled amplitudes from successive addresses of said memory; and
octave control means for changing the octave of the reproduced musical tone by shifting the digits of the binary signals from said address generating means at constant intervals of time, said octave control means comprising;
an octave change circuit for shifting the bits of said binary signals from said address generating means by a number of places established by a shift designating signals having plural different value options each corresponding to a shift of a different number of places;
selection switch means for selecting a desired one of a plurality of different octave slide patterns, and
octave change drive circuitry, responsive to said selection switch means, for providing repetitive sequences of shift designating signals, each such sequence including plural different value options in a sequential arrangement corresponding to the selected octave slide pattern.

4,080,863
ELECTROSTATIC EXPRESSION ENCODING APPARATUS FOR PERCUSSIVE KEYBOARD INSTRUMENTS

Charles R. Groeschel, 2402 Ansbury, Houston, Tex. 77018

Filed Oct. 27, 1976, Ser. No. 736,254
Int. Cl.[2] G10H *1/02*
U.S. Cl. 84—1.27 10 Claims



1. An apparatus for encoding the loudness of a note struck on a percussive keyboard instrument utilizing a hammer which strikes a sounding member, the apparatus comprising

a proximity means for detecting velocity of the hammer toward the sounding member;

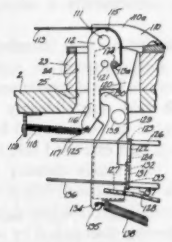
circuit means connected to said proximity means for forming an output signal of the velocity of the hammer as it passes said proximity means;

convertor means connected to said circuit means for forming a digital word which digital word encodes the velocity of the hammer as it moves past said proximity means, and wherein the loudness of the note struck by the hammer is related to the velocity of the hammer movement.

4,080,864
PEDAL ACTUATED PITCH-CHANGING MEANS FOR A STRINGED INSTRUMENT

David H. Jackson, 178 2nd Ave. N., Nashville, Tenn. 37203

Filed May 12, 1976, Ser. No. 685,517
Int. Cl.[2] G10D *3/14*
U.S. Cl. 84—312 P 13 Claims

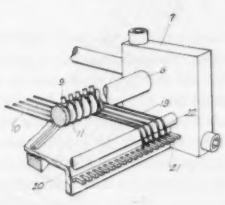


1. In a stringed instrument of the type having a head end, a tail end, a conventional tuning machine at its head end, a plurality of strings affixed at their head ends to said tuning machine, a pitch-changing means for raising and lowering by a determined amount the predetermined tuned pitch of individual ones of said instrument strings and a plurality of pedals for actuating said pitch-changing means, the improvement comprising a pitch-changing assembly for each of said instrument strings extending downwardly through an opening at said tail end of said instrument, said opening being substantially rectangular in configuration with its long dimension extending traversely of said instrument, fulcrum means mounted above said opening, each of said pitch-changing assemblies comprising a string finger, a raising bar and a lowering bar, said string finger having an upper end extending above said opening to which the tail end of one of said instrument strings is attached, said string finger having a lower end terminating in a leg extending below said opening, said string finger being pivotable about said fulcrum means from a normal position to a pitch-raising position in which the tension of said string attached thereto is increased and to a pitch-lowering position in which the tension of said string attached thereto is reduced, said raising bar being located adjacent and to one side of said string finger and having a lower end extending below said opening, said raising bar being pivotally attached to its respective string finger to pivot between a normal position and a pitch-raising position, said lowering bar being pivotally attached to said raising bar and being located to the same side thereof as said string finger, said lowering bar being pivotable between a normal position and a pitch-lowering position, said lowering bar having a lower end extending below said opening and having a foot at its upper end in abutment with said string finger leg, means for operatively attaching at least one pull rod to said raising bar whereby when a pulling force is applied to said raising bar pull rod toward the head end of said instrument said raising bar will pivot to said raising position urging said lowering bar foot against said string finger leg to pivot said string finger to said pitch-raising position, means for operatively attaching at least one pull rod to said lowering bar whereby when a pulling force is applied to said lowering bar pull rod toward the head end of said instrument said lowering bar will pivot to said lowering position and said lowering bar foot will shift in a direction away from said string finger leg to permit said string finger to pivot to said pitch-lowering position, means to normally retain said string finger, said raising bar and said lowering bar in their normal positions, a plurality of pull rods operatively attached to selected ones of said raising and lowering bars of said pitch-changing assemblies and means to operatively connect said pull rods to selected ones of said pedals by which a pulling force may be applied to said pull rods.

4,080,865
PITCH VARYING APPARATUS

Edward B. Gfell, 195 E. McMillan, Apt. 4, Cincinnati, Ohio 45219

Filed Nov. 26, 1976, Ser. No. 744,989
Int. Cl.[2] G10D *3/14*; G10C *3/10*
U.S. Cl. 84—312 R 4 Claims



1. In a keyboard instrument of the type having a keybed frame, a tuning machine attached to said frame, a first set of pins attached to said frame, and a first set of strings connected between said first set of pins and said tuning machine, the improvement in combination therewith comprising:

a. a shaft rotatably secured to said keybed frame, said shaft carrying a second set of pins;

b. a second set of strings connected between said tuning machine and said second set of pins;

c. a lever arm attached to one end of said shaft; and,

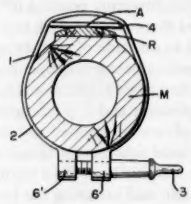
d. means for actuating said lever arm; whereby said lever arm may be actuated and said shaft may be rotated for varying the tension and pitch of said second set of strings as desired.

4,080,866

LIGATURE MEANS AND A METHOD OF SECURING A REED IN A WIND INSTRUMENT

Milo Rockwood Toof, Main St., Franklin, Vt. 05457

Filed Sep. 28, 1976, Ser. No. 727,477
Int. Cl.[2] G10D *9/02*
U.S. Cl. 84—383 R 6 Claims



1. A ligature for clamping a reed having arcuate and flat opposed surfaces to a woodwind instrument mouthpiece, comprising:

circular housing means, of split ring construction, for securing said reed on said mouthpiece;

clamping means for compressively clamping said housing onto said mouthpiece; and

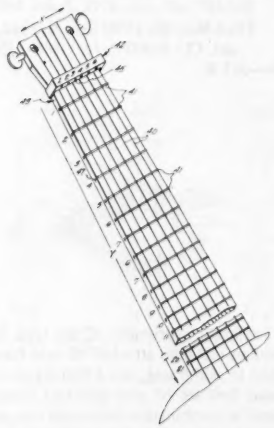
at least two rigid, linear bars located within said circular housing and extending transversely across said reed, each of said bars having a lower surface which contacts said reed arcuate surface substantially at a point on the longitudinal centerline of said reed, said bars being spaced from each other along said reed longitudinal centerline.

4,080,867

ELECTRONIC DISPLAY SYSTEM FOR MUSICAL INSTRUMENTS

Srinkarn Ratanangsu, 7752 Bellaire Ave., North Hollywood, Calif. 91605

Filed Sep. 22, 1975, Ser. No. 615,788
Int. Cl.[2] G10B *15/00;* G10F *5/00*
U.S. Cl. 84—477 R 4 Claims



1. An electronic system for driving a two-dimensional display for a musical instrument, such as a guitar or the like, comprising

display means having first and second series of light sources, said first series being comprised of one light for each string on said guitar, and being disposed at the neck of said guitar, and said series comprising one light source for each fret of said guitar, and being disposed along the top edge of the neck of said guitar, wherein illumination of one light source of each of said first and second series identifies by string and fret a musical note to be played on said instrument,

means for receiving a stored data word sequence representing musical notes to be played,

demodulator means for reading out said data words in parallel, and

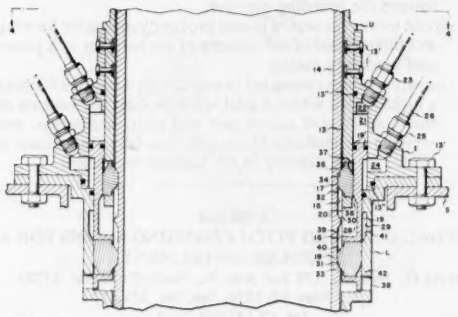
decoder means for receiving said data words in parallel and for operating one light in each of said first and second series of lights in response to each parallel data word.

4,080,868

SUPPORT AND RETENTION MECHANISM FOR MISSILES IN LAUNCHERS

Fredric A. Matthews, Atlanta, Ga., assignor to Lockheed Corporation, Burbank, Calif.

Filed Feb. 25, 1977, Ser. No. 771,944
Int. Cl.[2] F41F *3/06*
U.S. Cl. 89—1.806 8 Claims



1. A support and retention mechanism for a missile in a launcher mounted in substantially a vertical position on a vehicle comprising:

at least one dog carried by said launcher and having extended opposite sides adapted to seat alternatively in complemental grooves in said missile and in said launcher;

a retainer for each said dog slideably mounted in said launcher and adapted to move to and from extreme positions whereby each said extended side is held in said missile groove and the missile thereby engaged by said launcher and each said extended side is released for movement out of said missile groove into said launcher groove and the missile thereby disengaged by said launcher; and,

a fluid pressure system selectively operative on the upper and lower ends of said retainer to move it to and from, as well as hold it in, its extreme positions aforesaid, the pressure of said system being less than the force operative on said missile when ejected from said launcher, said system including:

a control valve having a neutral position connecting both ends of said retainer to return and alternate positions connecting a selected one of said retainer ends to pressure and simultaneously connecting the other of said retainer ends to return, and a check valve and a relief valve connected in parallel in said system between said control valve and said upper retainer end.

4,080,869

APPARATUS FOR GENERATING AN ELECTRICAL IGNITION CURRENT IN A FUZE OF A PROJECTILE

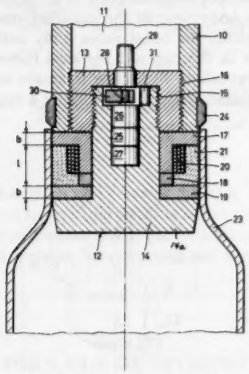
Panayotis Karayannis, Zurich, and Klaus Münzel, Klingnau, both of Switzerland, assignors to Werkzeugmaschinenfabrik Oerlikon-Buhrle AG, Zurich, Switzerland

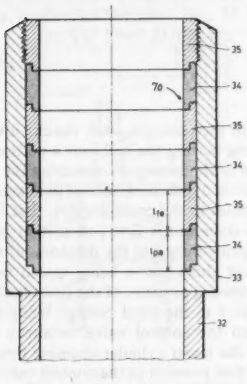
Filed Feb. 18, 1977, Ser. No. 770,001

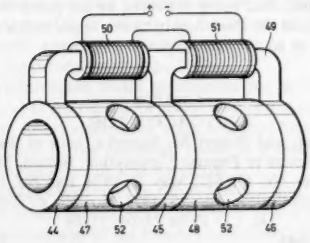
Claims priority, application Switzerland, Mar. 9, 1976, 2895/76

Int. Cl.[2] F42C *17/00*

U.S. Cl. 89—6.5 **6 Claims**







6. An apparatus for generating an electric ignition current in a fuze of a projectile intended to be fired out of the barrel of a weapon, comprising:

an induction coil located in the projectile;

a magnet for generating a magnetic field;

a two-part yoke, one part of which is located at the projectile and the other part at the weapon barrel, in order to produce a change in the magnetic flux upon passage of the projectile through the weapon barrel;

the part of the yoke located at the weapon barrel comprises:

a number of ferromagnetic rings; and paramagnetic rings arranged between the ferromagnetic rings;

the part of the yoke located at the projectile comprises:

a substantially cylindrical body member having a substantially disc-shaped flange for the reception of the induction coil; and

a soft iron disc;

the axis of the induction coil substantially coinciding with the axis of the projectile; and

said ferromagnetic rings and paramagnetic rings are arranged at the end of the weapon barrel.

4,080,870

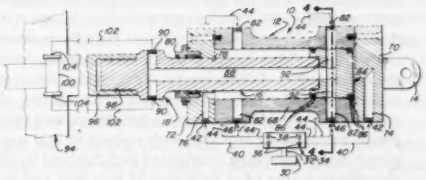
MULTIPLE POSITION FLUID CONDUCTOR APPARATUS

Elmer Gene Lusby, Littleton, Colo., assignor to Stearns Roger Corporation, Denver, Colo.

Filed Jan. 10, 1977, Ser. No. 757,843

Int. Cl.[2] F15B *13/06, 15/08*

U.S. Cl. 91—414 **10 Claims**



1. Multiple position fluid conductor apparatus comprising:

a cylinder having a first substantially closed head end provided with an actuation port for the flow of pressurized fluid and a second shaft bearing end formed with a central axial bore for slidably receiving a piston rod and provided with an actuation port for the flow of pressurized fluid;

a piston rod axially slidably mounted in the bore for reciprocation and provided with a formation at its outer end for connection to a load;

a piston connected to the inner end of the piston rod and slidable in the cylinder;

means forming at least one longitudinal pressure fluid flow passage in the rod extending throughout the major portion of its length and terminating in port means open to the exterior of the rod adjacent to its outer end;

means forming a fluid flow path in the piston between the inner end of the passage in the rod and the peripheral wall of the piston between its pressure faces;

and a plurality of power ports for the flow of pressurized fluid extending through the wall of the cylinder and located at longitudinally spaced stations;

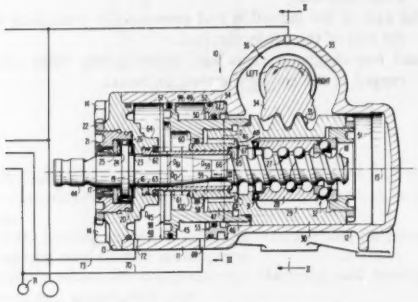
the piston being movable to any selected one of the stations to place its fluid flow path in flow communication registry with a power port located at that station.

4,080,871

PRESSURE MEDIUM SERVO MOTOR, ESPECIALLY FOR SERVO STEERING SYSTEMS

Klaus Katz, Stuttgart, and Jaromir Bordovsky, Berglen-Hosslinswart, both of Germany, assignors to Daimler-Benz Aktiengesellschaft, Germany

Filed Jan. 16, 1976, Ser. No. 649,807
Claims priority, application Germany, Jan. 17, 1975, 2501751
Int. Cl.[2] F15B *15/17*
U.S. Cl. 91—417 R 24 Claims



1. A pressure medium servo-motor comprising:
working cylinder means,
working piston means movably disposed in said working cylinder means, said working piston means exhibiting oppositely directed first and second working piston pressure surfaces which are acted on by respective first and second pressure mediums in respective first and second working cylinder pressure chambers, said working piston means being movable from a neutral rest position in a first direction with the aid of first predetermined pressure conditions in said working pressure chambers and being movable from said neutral rest position in a second opposite direction with the aid of second predetermined pressure conditions in said working pressure chambers,
and reducing piston means positioned radially inwardly of the working piston means in an annular space delimited in the radial outward direction by the working piston means and in the radial inward direction by a sealing sleeve means fixed to said working cylinder means, said reducing piston means being movable with respect to said working piston means and being configured and disposed to change the effective area of at least one of said first and second pressure surfaces in dependence on the direction of movement of said working piston means, whereby return movement of the working piston means to said rest position is facilitated.

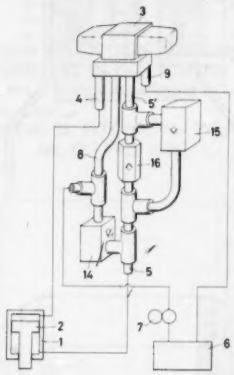
4,080,872

BOOST VALVE DEVICE

Seiji Shiokawa, 110-6 Matsumoto, Mishima, Shizuoka, Japan

Continuation of Ser. No. 568,524, Apr. 16, 1975, abandoned.
This application Oct. 22, 1976, Ser. No. 735,014
Int. Cl.[2] F15B *11/08, 13/042*
U.S. Cl. 91—436 1 Claim

1. A hydraulic fluid pressure control device for controlling the operation of a hydraulic cylinder having a piston and a rod affixed to the piston, the piston dividing the cylinder into an upper chamber and a lower chamber, a hydraulic fluid supply including a hydraulic fluid tank, a pump connected to the tank for receiving hydraulic fluid therefrom, fluid conduit means between the pump and the cylinder, the conduit means comprising a first conduit leading to the upper chamber, a second conduit leading to the lower chamber and a return leading to the tank, a directional control valve mounted in the conduit means and having respective ports communicating with the first and second conduits, the valve being operable between a first position wherein the pump is connected to the first conduit to supply hydraulic fluid to the upper cylinder chamber and the second conduit is connected to the return conduit, and a second position wherein the pump is connected to the second conduit to supply hydraulic fluid to the lower cylinder chamber and the first conduit is connected to the return circuit, a boost valve body assembled in abutting engagement with the directional control valve and having two opposite surfaces, the surfaces defining a plurality of ports, respective ones of the ports in the directional control valve being in fluid-tight assembly with the ports in one of the surfaces of the boost valve body, and a manifold assembled in abutting engagement with the boost valve body, the manifold having a plurality of ports in fluid-tight assembly with the ports in the oppisite surface of the boost valve body, one of the manifold ports being connected to the pump, the boost valve body defining between respective ports in the opposite surfaces thereof three fluid flow passages permitting fluid flow from the second conduit through the passages controlled solely by a respective check



valve in each of the passages, each check valve comprising a ball and a spring biasing the ball into a normally closed position, a first one of the passages connecting the second conduit to the pump, second and third ones of the passages connecting the second conduit to the control valve, first and second ones of the check valves in the first and second passages, respectively, being spring-biased in the direction of the second conduit, the second check valve being biased under a pressure exceeding the biasing pressure of the first check valve, and the third check valve in the third passage being spring-biased in the direction of the control valve, whereby hydraulic fluid flowing out of the lower cylinder chamber through the second conduit in the first position of the control valve flows through the first passage and opens the first check valve to continue flow towards the pump, this hydraulic fluid flow being added to the hydraulic fluid being delivered by the pump to the first conduit to boost the fluid supply to the upper cylinder chamber and thus to accelerate the piston velocity.

4,080,873

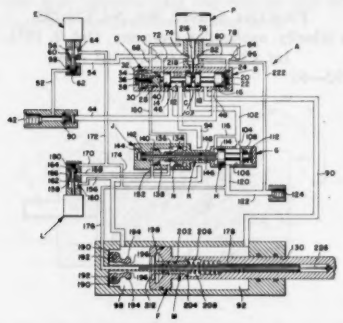
SERVOACTUATOR

Dan O. Bauer, and Robert M. Salemka, both of Kalamazoo, Mich., assignors to Pneumo Corporation, Boston, Mass.

Division of Ser. No. 472,627, May 23, 1974, Pat. No. 4,007,666.
This application Apr. 15, 1976, Ser. No. 677,497
Int. Cl.[2] F15B *11/08, 13/04*
U.S. Cl. 91—446 10 Claims

1. A system for controlling the position of a ram comprising selectively operable servovalve means for a ram selectively controlling fluid flow to and from said ram for extending or retracting said ram, means for selectively operating said servovalve means to control such fluid flow to said ram, spring-loaded pressure-operated actuator means for said servovalve means, and means for selectively connecting said actuator

means with a high fluid pressure source to shift said actuator means to a first position freeing said servovalve means to permit such selective operation of said servovalve means and



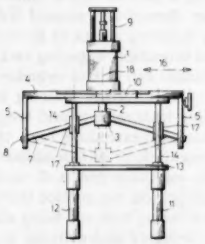
for venting pressure on said actuator means so that said actuator means moves to a second position under biasing force of a spring to move said servovalve means to a discrete position for supplying fluid pressure for retracting said ram.

4,080,874

DRIVE FOR A PAIR OF METERING PUMPS

Wilfried W. Burkhard, Muhlegasse 58, Barr, Switzerland (6340)

Filed Dec. 10, 1976, Ser. No. 749,512
Claims priority, application Germany, Dec. 13, 1975, 2556282
Int. Cl.² F04B *23/06*
U.S. Cl. 92—13.7 **9 Claims**



1. A drive for a pair of pumps for metering liquid to paste-like materials, each of the pumps comprising a piston rod element and a cylinder element, one of the pump elements being reciprocable in relation to the other, and a mounting frame fixedly supporting the metering pumps in spaced relationship, the drive comprising

(a) a reciprocable thrust mechanism for driving the one element of the pumps for reciprocation in a first direction,

(1) the thrust mechanism being arranged for movement in relation to the mounting frame in a second direction transverse to the first direction,

(b) a frame supporting the thrust mechanism,

(c) two levers having respective ends linked to the thrust mechanism and to the frame, respectively, and

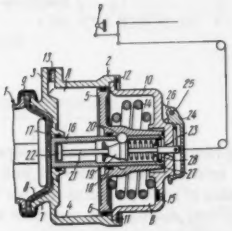
(d) means suspending the one pump element to the pump on a respective one of the levers whereby reciprocation of the thrust mechanism causes corresponding reciprocation of the suspended pump elements, the levers being laterally stationary with respect to the thrust mechanism and the suspending means being laterally stationary with respect to the mounting frame.

4,080,875

VEHICLE BRAKING MEANS

Alexandr Ivanovich Repolovsky, ulitsa Kerchenskaya 10, korpus 2, kv. 53; Ilya Kharitonovich Pakhter, ulitsa Semashko 5, kv. 10a; Alexei Dmitrievich Rudakov, prospekt Mira, 184, korpus 2, kv. 298; Alexandr Nikolaevich Baranov, Leningradsky prospekt, 28, kv. 160; Leonid Efimovich Gliner, ulitsa Chekhova 31/22, kv. 103; Dmitry Trdatovich Gapoian, ulitsa Onezhskaya 31, kv. 110, and Igor Veniaminovich Tumasiants, 4 Novo-Mikhailovsky proezd 6, kv. 149, all of Moscow, U.S.S.R.

Continuation of Ser. No. 598,816, Jul. 24, 1975, abandoned, which is a continuation of Ser. No. 498,666, Aug. 19, 1974, abandoned, which is a continuation of Ser. No. 366,079, Jun. 1, 1973, abandoned. This application May 5, 1976, Ser. No. 683,683
Int. Cl.² F01B *9/00*
U.S. Cl. 92—29 **5 Claims**

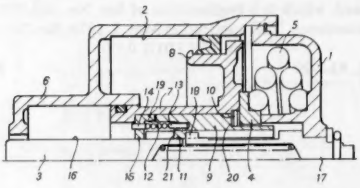


1. In a vehicle braking means comprising, in combination: a first housing defining a main chamber; a second housing attached to said first housing defining an auxiliary chamber; brake actuating mechanism contained in said main chamber; a piston accomodated in the auxiliary chamber, said piston having a bore therethrough a spring loading said piston in a brake applying direction; a piston rod accommodated in said auxiliary chamber slidably mounted in said bore of said piston and arranged for actuating said brake actuating mechanism; pressure fluid means for applying pressure to hold said piston against the action of said spring; locking means for releasably locking said piston rod and said piston together; and releasing means for manually releasing said locking means after said piston rod actuates said brake actuating mechanism following a loss of pressure, the improvement wherein said piston rod is hollow; said locking means and said releasing means are disposed within said piston rod; said locking means comprises at least one locking ball, said bore of said piston having an inscribed circumferential groove, and said piston rod having at least one opening on its circumference through which said at least one locking ball can partially pass, whereby said piston and said piston rod are locked together when said locking ball is seated in said groove; and said releasing means comprises guide means operatively associated with said at least one locking ball and disposed within said piston rod, said guide means having first and second surfaces, said first surface for holding said at least one locking ball seated in said groove, said second surface for allowing said at least one locking ball to be released from said groove thereby unlocking said piston rod from said piston, spring means for urging said guide means so that said first surface is contacting said at least one locking ball, and actuating means for moving said guide means against the action of said spring means so that said second surface is contacting said at least one locking ball thereby releasing said locking means.

4,080,876
SPRING-FORCE APPLYING MEANS

Philip Alan Sturgess, and Keith William Langley, both of London, England, assignors to Westinghouse Brake & Signal Co. Ltd., England

Filed Dec. 10, 1976, Ser. No. 749,709
Claims priority, application United Kingdom, Dec. 17, 1975, 51562/75
Int. Cl.[2] F01B 9/00
U.S. Cl. 92—29 5 Claims

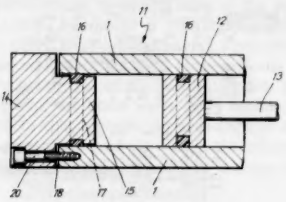


1. In a spring-force applying means comprising a housing member having an outer cylindrical shell and a hollow, elongated trunk portion of reduced radius relative to the shell, first and second relatively displaceable members at least partially located within said housing member, a force transmitting element located at least partially within said trunk portion, a spring which exerts the force thereof across said first and second members so as to cause relative displacement between said members in one direction and to thereby enable the spring to apply a force to said force transmitting element, and a fluid pressure responsive member located within said housing member which, responsive to a predetermined differential fluid pressure thereacross, exerts a force opposing the force exerted by said spring so that said first and second members are relatively displaced in a direction which is opposite to said one direction such as to at least partially relieve said force transmitting element of the force applied thereto by the spring, the improvement wherein said pressure responsive member includes a tubular portion sealingly slideable within said trunk portion of the housing member, the force transmitting element being contained at least partially in said tubular portion, said spring-force applying means further comprising a force applying element separate from, and capable of movement relative to, said pressure responsive member and said force transmitting element and contained at least partially within said tubular portion, said force-transmitting element including means for providing, in a first angular relationship between said force transmitting element and the force applying element, mutual engagement with said force applying element so as to enable transmission of the force of the spring and for providing, in a second angular relationship between said elements, mutual disengagement of said elements so that the elements are axially movable at all times, one with respect to the other, and are unable to transmit the force of the spring, and means operable from externally of said first and second members for engaging said force applying element to effect such mutual disengagement of the elements, said force applying element including an abutment face which in the first angular relationship is engaged with a corresponding abutment face on the force transmitting element, and the force applying element including at least one internal spline which provides said corresponding abutment face at the end thereof and in the second angular relationship is engageable with a corresponding end of an external spline on the force transmitting element.

4,080,877
WORKING CYLINDER FOR PNEUMATIC OR HYDRAULIC PRESSURE MEDIA

Jan Richard deFries, Hirschwiesenstrasse 9, Zurich, Switzerland

Filed Oct. 6, 1975, Ser. No. 620,283
Claims priority, application Germany, Oct. 9, 1974, 2448028
Int. Cl.[2] F01B 1/00; F16J 1/00
U.S. Cl. 92—61 2 Claims



1. A piston-cylinder module for fluid pressure media, comprising:

a cylinder formed from a quadrangularly-shaped, preformed imperforate hollow-sectioned material having quadrangularly-shaped inner and outer wall surfaces, the bore of said cylinder extending along the longitudinal axis of said hollow-sectioned material such that opposing wall members of said cylinder are parallel and have smooth outer surfaces, said cylinder including a longitudinally extending threaded hole in an end face thereof;

a cylinder cap including a projecting portion extending into said cylinder and a cover member forming a continuous external surface with the cylinder wall members, said projecting portion including a groove extending around the periphery thereof and a sealing member within said groove for sealing said cylinder bore, said cylinder cap further including a hole having a countersunk portion in the end surface thereof and aligned with said threaded hole receiving fastening means to be flush with said cap end surface and threadably engaging said threaded hole to secure said cylinder cap to said cylinder;

a wall of said cylinder further defining an enlarged wall section extending transverse to said longitudinal axis and including a laterally extending bore therein extending between the smooth outer surface of the opposing parallel wall members, said enlarged wall section including a countersunk portion on one surface thereof opening onto said laterally extending bore and being adapted for receiving means for fastening said cylinder to a mounting surface; and

a quadrauqularly shaped piston within said cylinder bore and including a piston rod extending through the open end of said cylinder.

4,080,878
APPARATUS FOR FORMING A STRIPABLE BACKING MATERIAL FOR PRESSURE-SENSITIVE ADHESIVE CARRYING SUBSTRATES

Nicholas D. Gallagher, and Richard L. Gibbs, both of Troy, Ohio, assignors to The Brown-Bridge Mills Inc., Troy, Ohio

Filed Jan. 5, 1977, Ser. No. 756,786
Int. Cl.[2] B31B 1/25
U.S. Cl. 93—58 ST 16 Claims

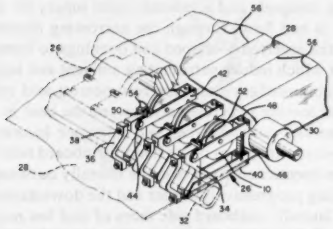
1. Apparatus for forming a compression scored paper release liner for use with a face stock carrying a pressure sensitive adhesive, said liner being releasably adherable to an opposite side of said adhesive from said face stock, comprising:

a compression forming area;

means in said area for providing a rigid support surface in contact with one side of said liner as it moves through said area;

cylindrical compression means mounted for rotation on an

opposite side of said liner from said support means and having a cylindrical rib of generally semi-circular cross section transverse to the direction of movement of said liner for compressing a narrow region along another side of said liner opposite said one side as said liner passes through said compression forming area;



means providing liner relief areas on each side of said narrow region in said compression forming area for allowing said liner to expand into said relief areas during compression of said region; and

means providing rigid land surfaces adjacent said relief areas extending outwardly from said relief areas and at a predetermined parallel spacing from said rigid support surface.

4,080,879

METHOD OF PRODUCING A CONTAINER AND APPARATUS HEREFOR

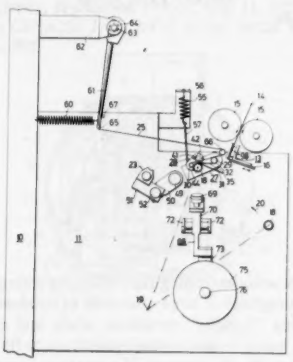
Ebbe Sigfrid Hodén, Mariefred, and Bo Roland Eklánge, Arla, both of Sweden, assignors to Kooperativa Forbundet (KF) Ekonomisk Forening, Stockholm, Sweden

Filed Dec. 17, 1976, Ser. No. 751,744

Claims priority, application Sweden, Dec. 23, 1975, 7514609

Int. Cl.² B31C *1/02*

U.S. Cl. 93—94 R **28 Claims**



1. A method of producing a sleeve from a heat-sealable foil blank, in which method the blank is so wrapped around a mandrel by means of a strip of flexible material acting on the side of said blank remote from the mandrel, that portions of said blank are caused to overlap each other, and in which method heat is applied to said portions in the overlapping region thereof to weld the same together, the improvement comprising the steps of maintaining a section of the strip tensioned between two strip-guides which extend substantially parallel to the mandrel and are moveable therearound; clamping a portion of the foil blank against said strip-section; moving at least one of the strip-guides around the mandrel in a direction away from the clamping point whilst successively placing strip material, and therewith also the foil blank, against the mandrel until the foil blank has been caused to encircle the mandrel around a major portion of its periphery and a first edge portion of said foil blank is caused to lie against the mandrel; moving one strip-guide in a direction to free said first edge portion from the strip-material and moving the other strip-guide in the same direction around the mandrel so that said first edge portion of said foil blank is covered by a second edge portion of said foil blank located opposite said first edge portion and by strip material; and heating the strip portion located on top of said first and said second edge portions so as to apply via said strip portion sufficient heat to said edge portions to weld the same together.

4,080,880

METHOD FOR PREPARATION OF CYLINDRICAL CORRUGATED ARTICLE

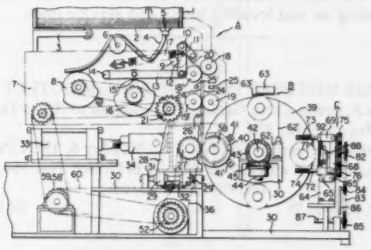
Yukihiro Shikaya, Tokyo, Japan, assignor to Dai Nippon Printing Company Limited, Tokyo, Japan

Division of Ser. No. 552,359, Feb. 24, 1975, Pat. No. 4,008,649. This application Dec. 3, 1976, Ser. No. 747,375

Claims priority, application Japan, Mar. 8, 1974, 49-26872; Mar. 14, 1974, 49-29505

Int. Cl.² B31C *1/08*

U.S. Cl. 93—94 R **3 Claims**



1. A method of manufacturing a cylindrical corrugated article, comprising the steps of;

providing a pair of oppositely rotatable forming rolls having interlocking corrugated surfaces;

supplying a sheet material between said pair of rolls to cause corrugation of the sheet material by pressing it with the corrugated surfaces of said pair of rolls as they rotate;

providing a ring-like guide structure positioned in surrounding relationship to and slightly spaced from the circumference of one of said rolls;

guiding the leading edge of said sheet, after it passes between the interlocking corrugated surfaces of the rolls, beneath the guide structure for causing the corrugated sheet to coil around said one roll to thereby form a cylindrical corrugated article;

relatively moving the pair of rolls transversely away from one another to effectively disengage the interlocking corrugations thereof after the corrugated article has been coiled around said one roll; and then

discharging the cylindrical corrugated article from said one roll.

4,080,881

BUILDING CONSTRUCTION

Henry Fred Campbell, Belleville, Mich., assignor to Campbell Research Corporation, Detroit, Mich.

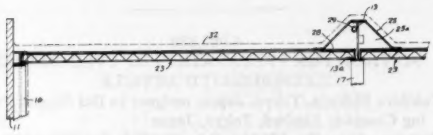
Continuation-in-part of Ser. No. 580,065, May 22, 1975, Pat. No. 3,987,714, which is a continuation of Ser. No. 452,751, Mar. 20, 1974, abandoned. This application Oct. 26, 1976, Ser. No. 735,266

Int. Cl.² F24F *7/04*

U.S. Cl. 98—31 **2 Claims**

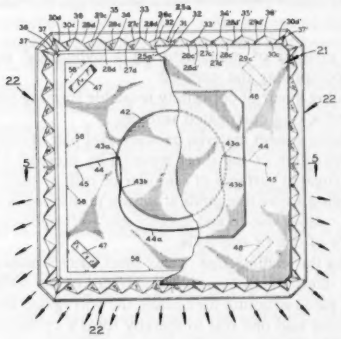
1. In a building construction, the combination comprising a plurality of vertical load-bearing columns,

a plurality of spaced parallel structural load-bearing I beams,
each said beam having a pair of upper webs and a pair of lower webs extending horizontally and being directly supported by said columns,
and at least two sets of load-bearing truss members extending between and resting on and supported by the lower webs of said beams,
each said truss member having a height less than the height of said structural beams,



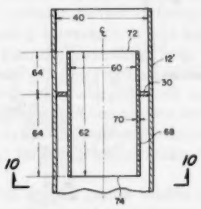
load-bearing ridgid sheets on the tops of said sets of truss members,
and roofing material over at least one said beam and the associated sheets of said sets of truss members defining an air duct extending longitudinally above the plane defined by the tops of said trusses adjacent each said beam for passing air and locating utility and service lines.

4,080,882
AIR DIFFUSER FOR CEILING AIR OUTLET
Herbert F. Bruns, Coral Gables, Fla., assignor to Bruns Technology, Inc., Miami, Fla.
Continuation-in-part of Ser. No. 575,146, May 6, 1975, Pat. No. 4,011,801. This application Feb. 7, 1977, Ser. No. 766,192
Int. Cl.[2] F24F *13/08*
U.S. Cl. 98—40 D **28 Claims**



1. In an air diffuser for attachment below a ceiling air outlet connected to a source of pressurized input supply air, said diffuser having a bottom panel, means for mounting said bottom panel extending immediately below the ceiling outlet to deflect the input supply air transversely outward below the ceiling outlet, and unitary wedge strips located at the periphery of said bottom panel, the improvement wherein each wedge strip comprises:
a base located at a higher level than said bottom panel and a row of adjoining, tetrahedronal wedges extending down from said base toward the periphery of the bottom panel;
the adjoining wedges in the row laterally outward from a reference location along the row having opposite, flat, triangular side faces which extend down from the base at opposite acute angles and intersect each other along an apex line which is inclined down from the base in the downstream direction of the input supply air flow transversely outward across and beyond said bottom panel;
the adjacent side faces of said adjoining wedges in the row at their respective lines of intersection with the base converging toward each other in said downstream direction and intersecting each other at the downstream side of the wedge strip, whereby to provide channels for the supply air flow between said adjoining wedges which at the base narrow to a point and provide inverted V-shaped exit openings for the air at the downstream side of the wedge strip, whereby the confronting side faces of said adjoining wedges compress and accelerate input supply air which is forced in and flows through the narrowing channels and out of the inverted V-shaped exit openings to form coherent jets which induce surrounding ambient and supply air;
the adjoining wedges along the row nearest said reference location leaning progressively toward the base in succession laterally outward from said reference location, with the downstream edges of the laterally inboard side faces of said last-mentioned wedges in the laterally outward direction being progressively longer and the downstream edges of the laterally outboard side faces of said last-mentioned wedges being progressively shorter, whereby to project the supply air laterally outward as well as directly away from the wedge strip;
and the apex lines of said last-mentioned wedges along the row being progressively inclined laterally outward away from said reference location in the downstream direction, with the angles between the apex lines of successive ones said last-mentioned wedges decreasing progressively laterally outward from said reference location, whereby the maximum increment of the laterally outward projection of the supply air along the row of wedges takes place closest to said reference location.

4,080,883
AIRRESTER
John S. Zink; Robert D. Reed, and Robert E. Schwartz, all of Tulsa, Okla., assignors to John Zink Company, Tulsa, Okla.
Filed Sep. 30, 1976, Ser. No. 728,069
Int. Cl.[2] F23L *17/02*
U.S. Cl. 98—58 **2 Claims**



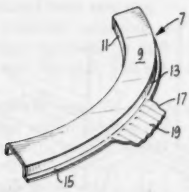
1. In an upwardly extending flare stack for emergency venting to the atmosphere of large quantities of combustible gases, wherein during "standby" condition, when said combustible gases are not being vented, a small maintenance flow of purge gas is provided, for the purpose of maintaining said stack free of air, the improvement in construction of said flare stack to ensure air-free conditions, comprising;
an annular ring plate mounted perpendicular to the axis of said stack inside said stack near the downstream end thereof, said annular ring plate providing an orifice of smaller cross-sectional area than said stack;
a thin-walled cylindrical tube of length at least equal to the diameter, sealably attached to the inside of said annular ring plate, a part of said tube extending upstream of said ring plate and part extending downstream;
whereby said maintenance flow of gas will flow through said orifice at a higher circumferential flow rate than the circumferential flow rate at the inner surface of said stack to prevent the upstream flow of air along the inner surface of said stack.

4,080,884

PIE CRUST SHIELD

Gerald K. Terrell, 1517 Vine Hill Rd., Santa Cruz, Calif. 95060

Filed Oct. 22, 1975, Ser. No. 624,667
Int. Cl.[2] A47J *36/00, 43/00*
U.S. Cl. 99—433 1 Claim



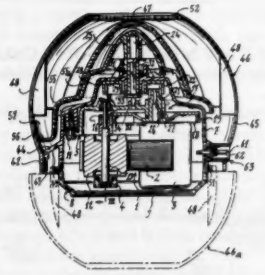
1. A four piece pie crust shield for protecting the edge of a pie crust which lies on the rim of a pie pan comprising an arcuate segment of metal foil, said arcuate segment being somewhat over 90° in angular dimension and having a U-shaped cross-section defined by an inner rim and an outer rim connected together by a flat center portion, and a stiffening flange on the outer rim, and having a tab formed integrally of the same piece of foil as said segment and flange extending from said flange, said tab being crimped to provide reinforcement, whereby a plurality of four of said segments can be placed over the pie rim in overlapping relationship of a pie tin to protect a crust thereon, throughout the entire circumference of the crust, said segments having sufficient flexibility so that they can be used with pies of more than one size.

4,080,885

DOMESTIC ELECTRIC SQUEEZER

Bernard Pauty, Fontaine les Dijon, France, assignor to SEB S.A., Selongey, France

Filed Aug. 30, 1976, Ser. No. 719,588
Claims priority, application France, Sep. 11, 1975, 75 27908
Int. Cl.[2] A23J *1/00;* A47J *43/08;* H02K *5/10*
U.S. Cl. 99—501 6 Claims



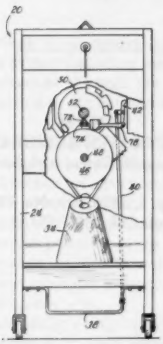
1. A domestic electric juice squeezer, comprising an encased motor, a shaft rotated by said motor via stepdown means, at least one juice pressing cone mounted on the shaft, a grid for filtering the extracted juice, a receptacle for collecting the filtered juice and a cover for protecting the apparatus when not in use, the grid being unitary with the motor casing, said grid comprising spaced radial bars inclined downwardly toward the outside of the apparatus and secured to a skirt extending in a circle around the outside of said grid, thereby permitting the juice to be guided toward said skirt, spaces between said grid bars being partially closed adjacent the casing by lugs inclined downward so as to prevent said juice from trickling along said casing, the motor being disposed in a casing which is completely closed and sealed, the shaft passing out through the casing, and sealing means on the shaft outlet through the casing, whereby the motor casing is thereby permitting the grid to be washed by complete immersion of the motor casing.

4,080,886

AUTOMATIC CLUTCH LOCK OUT MECHANISM FOR PACKAGE TYING MACHINE

Paul Pierce, Jr., La Grange, Ill., assignor to B. H. Bunn Company, Alsip, Ill.

Filed Mar. 4, 1977, Ser. No. 774,420
Int. Cl.[2] B65B *13/18*
U.S. Cl. 100—4 11 Claims



1. In a clutch operating mechanism for a package tying machine of the type comprising a support frame, a motor, a drive system including a clutch coupling the motor to a main cam and to a rotatably driven twine arm for wrapping a reach of twine about a package, and a trip mechanism for initiating a tying cycle; the clutch operating mechanism including a clutch lever for controlling the operation of the clutch and a follower lever interposed between the main cam and the clutch lever to transmit motion therebetween, the improvement comprising: a toothed cam gear rotatably journalled on the clutch lever, and a release lever interposed between said rotatable cam gear and the follower lever and operable to transmit motion to the clutch lever for controlling operation of the clutch, said release lever being responsively connected to the trip mechanism and having rack gear teeth formed thereon in meshing relation to the teeth on the cam gear, whereby initiation of the trip mechanism causes said release lever to translate and rotatably drive the cam gear to effect clutch engaging movement of the clutch lever.

4,080,887

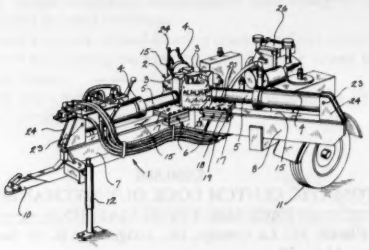
SCRAP VEHICLE WHEEL CRUSHER

Oliver L. Larsen, Rte. No. 2, Weyauwega, Wis. 54983

Filed Dec. 27, 1976, Ser. No. 754,543
Int. Cl.[2] B30B *7/04*
U.S. Cl. 100—35 7 Claims

1. The method of crushing a vehicle wheel rim with a tire thereon comprising applying radial pressure upon at least three

substantially equally circumferentially spaced locations against the tire to move the latter inwardly against the rim and collapse the rim, thereupon releasing the pressure and removing the tire from the collapsed rim.

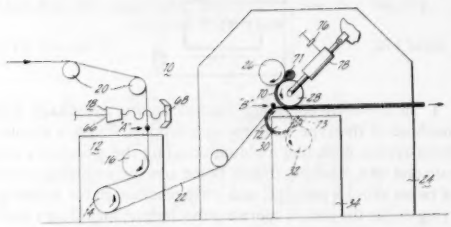


4,080,888

AUTOMATIC SPLICE RELIEF CONTROL

John Louis Bellis, Ansonia, Conn., assignor to USM Corporation, Boston, Mass.

Filed Sep. 1, 1976, Ser. No. 719,375
Int. Cl.² B30B *15/14*
U.S. Cl. 100—47 **1 Claim**



1. A calender roll machine for processing indeterminate lengths of flexible web having splices randomly disposed therein, said calender roll machine comprising:

at least two rotatable rolls for pressing said flexible web therebetween, at least one of said rolls being pressurizably biased toward the other roll;

a splice detector for sensing passage of a splice in said web;

a counter which is activated upon passage of a splice past said detector; said counter comprising a means for relieving said pressurizable bias;

said splice detector comprising a photo-electirc control unit;

said counter also comprising a rotatable member having an array of evenly spaced circumferentially disposed holes near its periphery, said holes in said rotatable member being counted by a counter mechanism, whereby counting of a predetermined number of holes in said rotatable member indicates that a predetermined length of web has traveled from said splice detector to the vicinity of said rolls, and said mechanism for relieving said pressurizable bias is activated, and for counting a predetermined number of holes in said rotatable member after said pressurizable bias is relieved, indicating passage of said splice between said rolls, said mechanism thereafter effects said pressurizable bias restoring a pressurizable nip to said traveling web; and

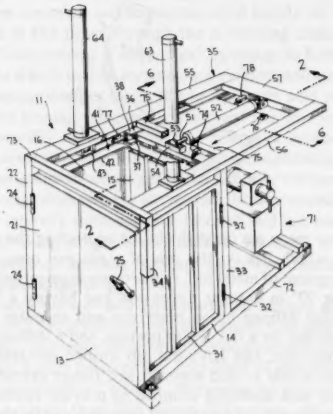
said counter including a fiber-optic apparatus to count the number of hole moving therepast said rotatable member.

4,080,889

DEVICE FOR COMPACTING TRASH AND THE LIKE

Mordechay Shiloni, 7702 Hanover Pkwy., Apt. 302, Greenbelt, Md. 20770

Filed Jun. 16, 1976, Ser. No. 696,852
Int. Cl.² B30B *1/34, 15/16*
U.S. Cl. 100—52 **16 Claims**



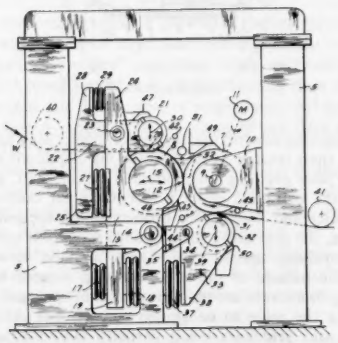
1. A device for compacting trash and the like comprising a bin for receiving the material to be compacted, said bin having an open top through which the material can be deposited into the bin and walls which define a volume into which the material is deposited in the bin, a horizontally disposed pressure plate for compacting the material, means for horizontally driving the pressure plate into a region above the volume where the material is deposited, and means for vertically driving the pressure plate between the region and the volume to compact the material in the bin and to return the plate to the region, each of said driving means including at least one cylinder and a piston that is driven in the cylinder, all of said cylinders being stationary relative to said bin.

4,080,890

VARIABLE NIP MINIMUM WRAP CALENDER

George L. Dreher, Beloit, Wis., assignor to Beloit Corporation, Beloit, Wis.

Filed Oct. 12, 1976, Ser. No. 731,434
Int. Cl.² B30B *3/04*
U.S. Cl. 100—170 **15 Claims**



1. A variable nip minimum wrap calender, comprising:

a supporting structure;

a pair of calender rolls comprising a first roll and a second

roll carried rotatably by said supporting structure and providing a calendering nip

means for relatively adjusting the pair of rolls to control the nip pressure;

means for driving at least one of said pair of rolls rotatably;

means for limiting wrap of a travelling web to be calendered in said nip to respective surface segments of about 90° on said rolls measured from said nip;

said means for relatively adjusting the rolls comprising a movable carriage mounted on said supporting structure and carrying said first roll, and means for actuating said carriage;

a carriage mounted to pivot on said first roll carriage and carrying another roll in nipping relation to said first roll;

and means for pivotally actuating said another roll carriage on and relative to said first roll carriage for effecting nipping adjustments of said another roll relative to said first roll.

4,080,891

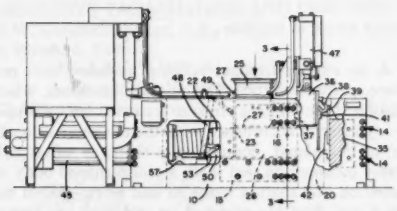
BALING PRESS

Nicholas L. Manko, Piqua, Ohio, assignor to The French Oil Mill Machinery Co., Piqua, Ohio

Division of Ser. No. 540,800, Jan. 14, 1975, Pat. No. 3,965,814. This application Apr. 29, 1976, Ser. No. 681,611

Int. Cl.[2] B30B *15/30*

U.S. Cl. 100—215 **2 Claims**



1. A baling press for compressing material to be baled, such as loose crumb polymeric material, comprising:

a bolster for reciprocating between a retracted position and an advanced position,

means forming a cavity within which said bolster reciprocates, said means defining cavity walls surrounding said bolster defining two dimensions of a bale and extending between the advanced and retracted positions of said bolster,

means defining a discharge orifice at the end of said cavity spaced beyond the advanced position of said bolster by an amount corresponding to the third dimension of a bale and through which the baled material is discharged by movement of said bolster beyond said advanced position,

movable means for closing said discharge orifice to provide a surface against which said bolster compresses said material when in said advanced position,

means for moving said movable means in a direction perpendicular to the direction of movement of said bolster to open said discharge orifice at the end of said cavity permitting discharge of said baled material after said baled material is compressed within said cavity and to close said discharge orifice and wipe the bolster free of the baled material after said baled material is discharged, and

means for supplying material to be baled to said cavity, including a supply opening into said cavity which is located adjacent the retracted position of said bolster such that substantial compression of said material does not occur until said bolster has moved past said supply opening and said material is held between said cavity walls, said movable means, and said bolster, said means for supplying material further including a selectively openable door covering said supply opening and opening to admit material into said cavity.

4,080,892

APPARATUS FOR DRIVING DOTTING HAMMERS OF A MATRIX PRINTER

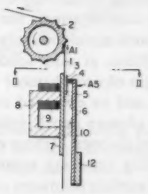
Issei Imahashi, 1321-1, Iwamori, Futaba-cho, Kitakoma, Yamanashi, Japan

Filed Sep. 17, 1976, Ser. No. 724,212

Claims priority, application Japan, Sep. 29, 1975, 50-117471

Int. Cl.[2] B41J *7/70*

U.S. Cl. 101—93.04 **5 Claims**



1. The improvement in an apparatus for driving dotting hammers of a matrix printer including means for moving printing paper which advances through the printer adjacent the hammers in one direction as the hammers dot the paper which comprises:

a. a plurality of electro-magnets mounted in parallel position on the printer along the printing paper in a direction normal to the direction of advancement of the paper and at one side of the printing paper;

b. at the other side of the paper a standard reciprocally moveable to various positions along the printing paper in a direction normal to the direction of advancement of said printing paper and moveable adjacent the parallel position of the electro-magnets; and

c. flexible elongate electro-magnetically attractable plates each having a dotting hammer mounted along the standard in spaced parallel relation to the electro-magnets and adjacent the printing paper, wherein the electro-magnets attract the plates towards the electro-magnets and thus cause the dotting hammers to dot the paper as the standard is moved to the said variable positions and wherein the spacing of the electro-magnets mounted on the printer is one-half the spacing of the plates mounted on the standard, wherein there are twice as many electro-magnets as plates and wherein the electro-magnets are activatable alternately depending upon the position of the standard so that magnetic lines of force from an activated electro-magnet are absorbed by an adjacent non-activated electro-magnet while the activated electro-magnet attracts a plate.

4,080,893

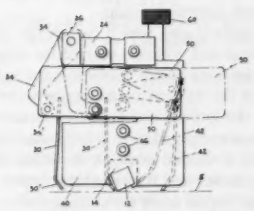
INK SCOOP SQUEEGEE ASSEMBLY

David A. Wedell, Sparta, Mich., assignor to James A. Black, Sparta, Mich.

Filed Oct. 7, 1976, Ser. No. 730,307

Int. Cl.[2] B41F *15/44*

U.S. Cl. 101—124 **5 Claims**



1. A squeegee assembly for use with a stencil frame mounting a stencil screen, comprising:

support means for supporting the squeegee assembly in a stencil frame;

a squeegee retainer suspended from and spaced below said support means and configurated to retain a resilient squeegee element for cooperative relationship with the stencil screen;

a pair of spaced, end members at opposite ends of said squeegee retainer to retain stencilling fluid;

a pair of front and rear closure panels astraddle of said squeegee retainer, means operatively coupled with both of said front and rear closure panels for shifting said front and rear closure panels simultaneously between a cooperative retracted condition at said squeegee and squeegee retainer, forming a closed chamber for stencil fluid around said squeegee, and an extended condition with both said front and rear closure panels spaced from said squeegee retainer to form an open bottom chamber; said means for shifting including camming means comprising cam surfaces and cam surface followers connected to one of said front and rear panels, and second cam surfaces and cam surface followers connected to the other of said front and rear panels.

4,080,894

ROTARY PRINTING MACHINES

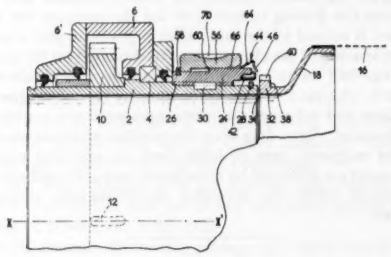
Roger Weber, Pfastatt, and André Lotte, Mulhouse, both of France, assignors to Societe Alsacience de Constructions Mechaniques de Mulhouse, Mulhouse, France

Filed Jul. 20, 1976, Ser. No. 706,950

Claims priority, application France, Aug. 12, 1975, 75 25046

Int. Cl.² B41F *15/38*

U.S. Cl. 101—128.1 **15 Claims**



1. In a rotary printing machine, apparatus for mounting a ferrule of a rotary cylindrical screen on the casing of a printing head wherein the ferrule is held facing the end surface of said casing without being engaged within the casing, the improvement comprising:

means for locking and centering the ferrule to the casing;

means carried on the ferrule for receiving portions of said locking and centering means;

an annular locking ring which carries the locking and centering means and which is carried for sliding axial movement on the inner end of the casing, the locking ring being slidable on the body of the casing between a first position in which the locking and centering means and the receiving means are engaged to lock and center the ferrule to the casing and a second position in which the locking and centering means and the receiving means are disengaged to free the ferrule from the casing, and

means for mounting the locking ring on the casing to cause said ring to be rotatable with said casing.

4,080,895

DEVICE FOR THE TRIPPING OF PRINTING CYLINDER INTO PRESSURE CONTACT

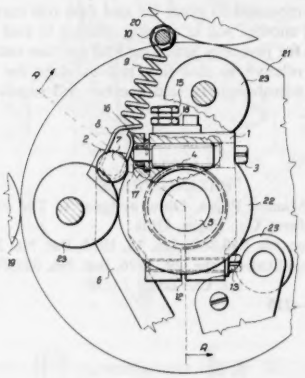
Zbynek Liska, Adamov, Czechoslovakia, assignor to Adamovske strojirny, narodni podnik, Adamov, Czechoslovakia

Continuation-in-part of Ser. No. 707,522, Jul. 22, 1976, abandoned. This application May 13, 1977, Ser. No. 796,678

Claims priority, application Czechoslovakia, Aug. 5, 1975, 5443/75

Int. Cl.² B41F *13/24*

U.S. Cl. 101—218 **4 Claims**



1. A device for tripping printing cylinders into printing pressure, particularly on offset printing machines, where the regulation of the printing pressure is carried out by tripping an offset cylinder in accordance with the thickness or quality of paper to be printed, comprising a shaft, an offset cylinder rotatably mounted on said shaft, a worm-shaped body rigidly mounted on said shaft, a worm in said worm-shaped body, a worm wheel rotatably mounted on said shaft and threadably engaged with said worm, a carrier lever integrally formed with said worm wheel, a pull rod for tripping the printing cylinders, a carrier pivot connecting the pull rod to the carrier lever for tripping the printing cylinders into printing pressure contact and release, said worm-shaped body being provided with a clamping groove dividing said worm-shaped body, and a securing screw passing through said clamping groove for selectively clamping a portion of said worm-shaped body against a portion of said worm wheel and said shaft to secure said wheel for rotation with said shaft.

4,080,896

METHOD FOR HIGH SPEED APPLICATION OF PRINTING CODE INDICIA

James G. McKay, deceased, late of Skokie, Ill., and by Allen J. McKay, executor, Palatine, Ill., assignors to Kiwi Coders Corporation, Chicago, Ill.

Division of Ser. No. 571,906, Apr. 28, 1975, Pat. No. 4,047,879. This application Feb. 18, 1977, Ser. No. 770,005

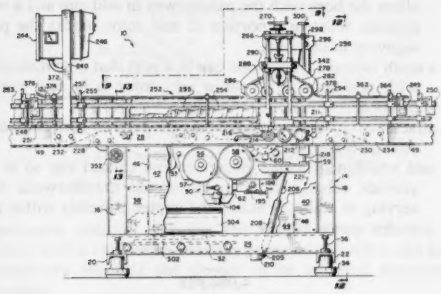
Int. Cl.² B41F *17/00*

U.S. Cl. 101—426 **8 Claims**

1. A method for the high-speed application of printing code indicia consecutively upon individual articles moving in a line along the upper reach of a conveyor to an imprinting zone arranged along a path of the conveyor, the imprinting being performed by plural printing heads carried by an imprinting wheel, the printing heads intercepting the article at an imprinting location within the imprinting zone; said method comprising:

spacing the articles uniformly one from the other a predetermined distance as they travel along the conveyor to the imprinting zone, restricting lateral movement of the articles through the imprinting zone, applying a positive force

directed downward upon the top of each article at least when the imprint is applied temporarily to immobilize the article at the time the imprint is applied at the imprinting location and controlling the speed of circumferential



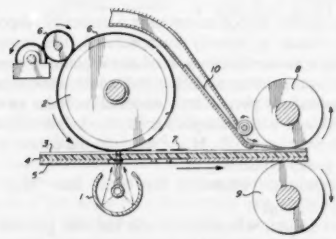
rotation of the imprinting wheel so that the circumferential speed of rotation thereof is correlated with the speed of the conveyor and the number of printing heads carried by the imprinting wheel.

4,080,897

SELECTIVE TACK IMAGING AND PRINTING

Robert W. Gundlach, Victor, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jan. 7, 1977, Ser. No. 757,521
Int. Cl.[2] B41M *1/08*; B41C *1/10*
U.S. Cl. 101—467 **5 Claims**



1. A method of printing which comprises:
(a) providing a transparent self-supporting substrate,
(b) applying a coating to said substrate of a transparent, abhesive polymer,
(c) placing said abhesive coating in contact with an ink surface and simultaneously subjecting said abhesive coating and ink to activating electromagnetic radiation in image configuration, in an amount and for a time sufficient to selectively deposit ink in said image configuration on said abhesive coating, and
(d) transferring said inked image to a receiver sheet.

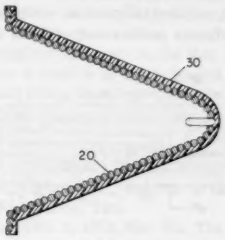
4,080,898

SPIRAL WRAPPED SHAPED CHARGE LINERS AND MUNITION UTILIZING SAME

Harry A. Gieske, 14704 Pebblestone Dr., Silver Spring, Md. 20904

Filed Feb. 5, 1976, Ser. No. 655,611
Int. Cl.[2] F42B *1/02*
U.S. Cl. 102—24 HC **2 Claims**

1. A shaped charge liner comprising a spirally wrapped wire or rod in the form of a concave shell having an apex and a base with one end of said wire or rod projecting from said apex towards said base to act as a means for holding the liner during



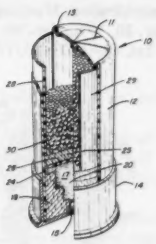
manufacture and for forming a leading portion of a shaped charge jet when utilized in a shaped charge munition.

4,080,899

LIGHT REFLECTIVE SHOT PELLETS

William L. Luban, 8133 Alabama Ave., Clarendon Hills, Ill. 60514

Filed Dec. 20, 1976, Ser. No. 752,442
Int. Cl.[2] F42B *7/04*
U.S. Cl. 102—42 R **3 Claims**



1. Light reflective shot pellets for a shotgun cartridge including a tubular cartridge casing having a shot chamber, shot pellets in the shot chamber, and detonation means, the improvement comprising in combination:
a light reflective coating encapsulating the shot pellets to permit tracking of the pellets' trajectory to the target situs, the coating being the residue of a liquid mixture of which titanium dioxide is the principal light reflective element and with water being the principal vehicle of the liquid mixture prior to application to the shot pellets,
a thin lubricant film coating the shot pellets to prevent adhesion between coated pellets, and
a protective plastic liner surrounding the shot pellets in the shot chamber whereby detonation of the cartridge discharges the protective, plastic liner with the shot pellets from the barrel of the shotgun to prevent erosion of the coated pellets and fouling of the barrel.

4,080,900

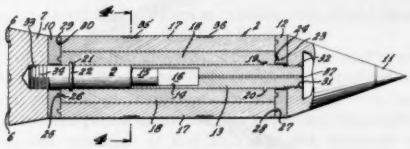
PROJECTILE

Bruno W. Augenstein, and Charles B. Dougherty, both of Santa Monica, Calif., assignors to The Rand Corporation, Santa Monica, Calif.

Filed Nov. 24, 1950, Ser. No. 197,264
Int. Cl.[2] F42B *13/48*
U.S. Cl. 102—67 **6 Claims**

1. A projectile comprising a nose section having a central core extending backward therefrom, said core having a cylinder in the tail end thereof adapted to receive a piston, a tail section having a central core extending forward therefrom, the front end of said core carrying a piston adapted to fit within said cylinder, an explosive charge within said cylinder opera-

tively connected to a fuse carried by said projectile, said piston being within said cylinder so that upon explosion of said charge, said piston and cylinder are forced apart to separate said nose section and said tail section, a bundle of rods extending between said nose section and said tail section arranged



about said central cores, and projection on each end of each rod engaging with corresponding depressions in said nose section and said tail section respectively for holding said rods in position until said charge is detonated and said sections are separated.

4,080,901

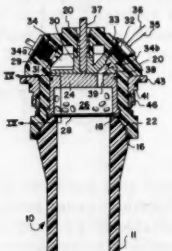
MOLDED COMPOSITE PYROGEN IGNITER FOR ROCKET MOTORS

Wilbur C. Heier, Hampton, and Melvin H. Lucy, Virginia Beach, both of Va., assignors to The United States of America as represented by the Aministrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Apr. 20, 1976, Ser. No. 678,520

Int. Cl.² F42B *15/10*

U.S. Cl. 102—49.7 **12 Claims**



1. A standardized lightweight pyrogen assembly for rocket motors comprising:

a molded plastics elongated tube containing the pyrogen charge and adapted to be inserted in a rocket motor case for ignition of the rocket motor charge,

said elongated tube being open at one end and having at least one passageway at the other end thereof for expelling ignition gases into the rocket motor,

a molded plastics cap closing the open end of said elongated tube and serving as a closure for the rocket motor case,

said elongated tube being provided with external spiral buttress threads on the open end and said cap being provided with internal spiral buttress threads for attachment to said elongated tube,

said cap containing an ignition pellet cup and pellet retention means serving to close the open end of said cup for retaining an ignition charge therein, the other end of said cup being provided with a passageway to permit entrance of ignition gases to the interior of said cup,

a safe-arm rotor disposed within said cap,

said safe-arm rotor being provided with a bore therethrough, and rotatable from an armed position wherein said rotor alines the bore with the passageway in said cup and a safe position wherein a portion of said rotor blocks the passageway in said cup,

a squib retained within said cap in a port that communicates with said rotor bore when said rotor is in said armed position,

attachment means circumscribing the exterior surface of said closure cap, and

said attachment means being secured to said cap so as to provide relative rotative movement therebetween and serving to sealingly attach the igniter assembly within the rocket motor casing.

4,080,902

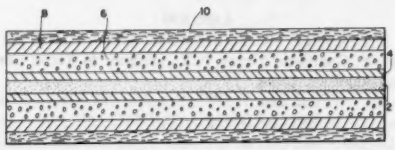
HIGH SPEED IGNITER DEVICE

Terrence P. Goddard, Aptos; Samuel D. Webb, and Donald N. Thatcher, both of Hollister, all of Calif., assignors to Teledyne McCormick Selph, Hollister, Calif.

Filed Nov. 4, 1976, Ser. No. 738,763

Int. Cl.² F42B *3/10*

U.S. Cl. 102—70 R **64 Claims**



1. In an igniter device comprising a centrally disposed high explosive which is linearly encapsulated, the improvement comprising a linear distribution of metal cladded pyrotechnic material about said encapsulation and in intimate contact therewith, wherein said pyrotechnic material includes an oxidizing agent combined with a simple decahydrodecaborate salt, having the common anion $B_{10}H_{10}^{-2}$ wherein the cation is selected from the group consisting of:

i. ammonium, wherein the salt has the formula $(NH_4)_2B_{10}H_{10}$;

ii. hydrazinium, wherein the salt has the general formula $(NH_2NH_3)\ B_{10}H_{10}$;

iii. substituted ammonium cations, wherein the salt has the general formula $(R_3NH)_2B_{10}H_{10}$, wherein further R is selected from the group consisting of hydrogen and alkyl radicals containing less than six carbon atoms;

iv. substituted hydrazinium cations, wherein the salt has the general formula $(R_2NNR_2H)_2B_{10}H_{10}$ wherein further R is selected from the group consisting of hydrogen and alkyl radicals containing less than six atoms.

4,080,903

PROCESS AND APPARATUS FOR LAYING TIES FOR A RAILWAY TRACK

Yvo Cicin-Sain, Bussigny, Switzerland, assignor to Matisa Industries S.A., Lausanne, Switzerland

Filed Feb. 25, 1977, Ser. No. 772,232

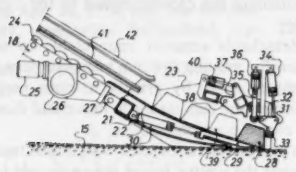
Claims priority, application Switzerland, Mar. 5, 1976, 2748/76

Int. Cl.² E01B *29/10*

U.S. Cl. 104—6 **9 Claims**

1. A method of continuously laying sleepers at permanent positions at predetermined intervals on a bed of ballast for a railway track, by means of a vehicle travelling along the track, which method comprises feeding each sleeper in turn from a stock of sleepers to a laying mechanism where the sleeper is

held a little above the level of the bed of ballast, removing vertical support from beneath the sleeper at a position in advance of the intended permanent position of the sleeper so that the sleeper falls onto the bed ballast in advance of its intended



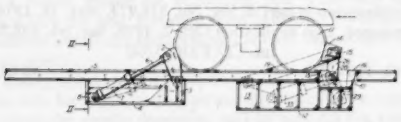
permanent position, drawing the sleeper along the bed of ballast until it reaches its intended permanent position and then completely releasing the sleeper in its intended permanent position.

4,080,904

RAILWAY CAR POSITIONING APPARATUS

Gerard V. Lofink, Coraopolis, and Carl J. Vozniak, Pittsburgh, both of Pa., assignors to Heyl & Patterson, Inc., Pittsburgh, Pa.

Filed Jul. 28, 1976, Ser. No. 708,856
Int. Cl.[2] B61B *13/12*; B61K *7/20*
U.S. Cl. 104—162 **7 Claims**



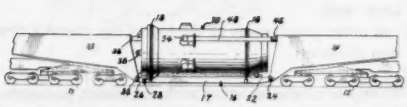
1. Positioning apparatus for moving railway cars a short distance forward along track rails away from gaps in the rails, comprising a pair of laterally spaced wheel chocks each normally supported in a rail gap and having a straight upper surface over which car wheels can roll in crossing the gap, an arm pivotally connected on a horizontal axis to each chock and extending forward therefrom, means pivotally supporting the front ends of the arms on a horizontal axis, and lifting means for moving the chocks and rear ends of said arms upwardly to raise the chocks bodily out of said rail gaps and above the level of said last-mentioned horizontal axis, whereby the arms will swing the chocks forward to move car wheels engaged by them forward on the track.

4,080,905

SCHNABEL RAILWAY CAR SKID SHIPPING ASSEMBLY

John P. Cook, Chattanooga, Tenn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Dec. 22, 1975, Ser. No. 643,429
Int. Cl.[2] B61D *3/14, 3/16*; B65G *61/00*; B66F *9/00*
U.S. Cl. 105—367 **6 Claims**



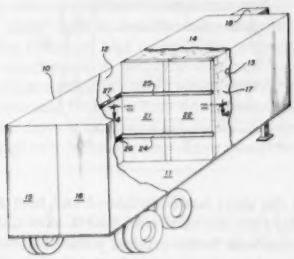
1. A shipping vehicle for an elongate load having a lateral projection intermediate ends thereof comprising separable wheeled sections at opposite ends of the load arranged to comprise a Schnabel-type car, an elongate load carrying skid between sections of the car, pivotal lugs at opposite ends of the skid for attachment to the spaced apart sections of the car, means pivotally attaching the lugs to adjacent sections of the Schnabel car, and a compression beam extending longitudinally intermediate the lateral projection on the load and a wheeled section of the car enabling compressive forces effected by the weight of the load on the skid to be transmitted horizontally from a section of the Schnabel car through the compression beam to the lateral projection on the load.

4,080,906

SHIPPING BULKHEAD

James W. Brown, Dallas, Tex., assignor to General Packaging Corporation, Richardson, Tex.

Filed Oct. 1, 1976, Ser. No. 728,519
Int. Cl.[2] B60P *7/14*
U.S. Cl. 105—489 **10 Claims**



1. A bulkhead for installation at any selected location across a compartment which comprises:

(a) a first multi-ply panel having front and rear faces with a narrow integral flap along the left edge, a narrow flap across the top and a narrow partial thickness extension along the right edge;

(b) a second multi-ply panel having front and rear faces with a narrow integral flap along the right edge, a narrow flap across the top and a narrow partial thickness extension along the left edge;

(c) said narrow partial thickness extensions overlapping one another to form a smooth integral wall from one side of said compartment to the other, the combined width of said panels being less than the width of said compartment and the combined width of said panels plus said partial thickness extensions being greater than the width of said compartment.

4,080,907

SHELF FABRICATED FROM A SINGLE SHEET OF THERMALLY DEFORMABLE MATERIAL

Ric Kaufman, 2505 Mariposa, San Francisco, Calif. 94110

Filed Jan. 21, 1977, Ser. No. 761,197
Int. Cl.[2] A47B *55/00*
U.S. Cl. 108—59 **1 Claim**

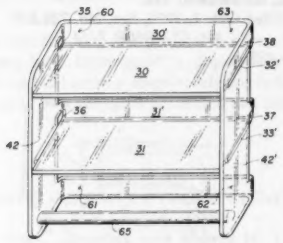
1. A shelf case which comprises a single generally rectangular sheet of thermally deformable material, the sheet having:

first and second spaced apart axes each of which extends from one side edge to the opposite side edge parallel to and spaced from the end edges;

third and fourth spaced apart axes each of which extends longitudinally from one end edge to the opposite end edge perpendicular to the first and second axes and spaced from the side edges to define first and second sidewall portions each comprising portions of the sheet adjoined to a side edge;

a continuous cut which terminates at both ends within the sheet, the cut having a first portion which extends along the second axis from the third axis to the fourth axis defining the frontal edge of a shelf, second and third portions which extend along the third and fourth axes respectively

from the first axis to the second axis defining shelf ends having tabs, fourth and fifth portions which respectively extend along the first axis from the third axis toward the one side edge and from the fourth axis toward the opposite side edge defining tab receiving slots, the cut further defining a pair of opposed apertures at the intersections of the second and third portions with the fourth and fifth portions respectively, the apertures facilitating the making of the cut by providing a convenient area for a machine tool to enter the sheet and start the cut with minimal danger of damage to the sheet resulting from drifting of the tool;



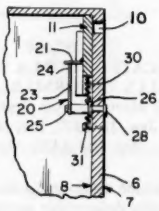
and wherein the sheet has been heated and bent along the first axis between the third and fourth axes to form the shelf perpendicular to the original plane of the sheet, and the sheet has been heated and bent along the third and fourth axes to define the sidewall portions of the shelf perpendicular to the original plane of the sheet with a rear wall therebetween, the apertures providing the necessary clearance to allow the tabs to be inserted into the slots without buckling adjacent portions of the sheet, and further wherein the tabs are free to move within the slots so that the shelf case can flex upon impact to minimize damage thereto.

4,080,908

SHUTTER ASSEMBLY FOR SLOT OR APERTURE

Eric L. Bianco, 120 E. Price St., Linden, N.J. 07036

Filed Feb. 7, 1977, Ser. No. 766,074
Int. Cl.[2] E05G *1/026*
U.S. Cl. 109—66 **2 Claims**



1. In a shutter assembly for a sized opening through a partition having a front face and a rear face;

a. support members on the rear face of the partition in spaced relation to each other and disposed on opposite sides of the sized opening to define with the partition spaced channels,

b. closure means mounted between said support members and slidably disposed for movement in said channels towards and away from the sized opening,

c. actuating means mounted on said partition for moving said closure means and for normally maintaining said closure means so as to close said sized opening, and operative to permit the closure means to open said sized opening,

d. said actuating means including,

1. cam follower means connected to the closure means,

2. a cam means disposed for movement into and out of engagement with the cam follower means for moving the closure means from open to closed position and for maintaining the closure means in the closed position, and

3. a detachable actuator connectable to said actuating means for moving the cam means to permit the closure means to move by gravity to open position and for operating the cam means to move said closure means to the closed position, and

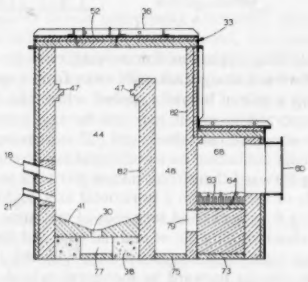
e. means operatively associated with said actuating means to overcome the inertial forces acting on said closure means to assist in movement of said closure means to the normally closed position.

4,080,909

POLLUTION FREE MULTI-CHAMBERED BURNER

Noubar Nalbandian; David P. Holmes, both of Seattle, and Alan B. Fletcher, Kirkland, all of Wash., assignors to Envirometrix, Inc., Seattle, Wash.

Continuation-in-part of Ser. No. 524,973, Nov. 18, 1974, abandoned. This application Oct. 2, 1975, Ser. No. 618,826
Int. Cl.[2] F23G *5/00*
U.S. Cl. 110—235 **16 Claims**



1. A multi-chambered enclosure for substantially pollution free burning of organic waste material and for the generation of heat energy, comprising:

(a) a primary combustion chamber having a generally cylindrical inner wall acting as an ignition surface for combustants and restraining combustants in a spiraling cyclonic flow pattern dispersed along said inner wall;

(b) means for introducing air/fuel mixture to approach and converge toward the primary combustion chamber inner wall so that they flow tangentially along said cylindrical inner wall;

(c) an outlet passageway at the top of the primary combustion chamber;

(d) a counterflow chamber having an inlet passageway near its top in communication with the outlet passageway of the primary combustion chamber, said counterflow chamber being comparatively larger than its inlet passageway to expand and decelerate the gases; and

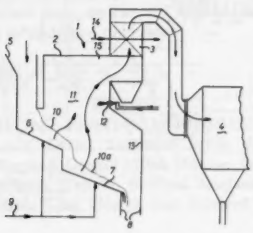
(e) a purification chamber containing porous filter material and having an inlet below said filter material in communication with the counterflow chamber.

4,080,910

PROCESS FOR COOLING THE FLUE GASES IN WASTE MATERIAL INCINERATION PLANTS WITHOUT HEAT UTILIZATION

Pierre Jaccoud, Jona, Switzerland, assignor to Von Roll AG, Switzerland

Filed Apr. 26, 1976, Ser. No. 680,476
Claims priority, application Switzerland, Apr. 29, 1975, 5491/75
Int. Cl.[2] F23G 5/00; F23J 15/00
U.S. Cl. 110—210 9 Claims



1. An apparatus for cooling the flue gases in waste material incinerating plants having a combustion chamber, a flue gas cooler and a gas cleaner connected in series, said apparatus comprising:

a source of secondary air;

a source of water;

mixing nozzle means for combining said water and said secondary air and spraying them into said combustion chamber above the incinerating material before said flue gas cooler;

said mixing nozzle means comprising:

a jet tube for the secondary air and a jet tube for the water, means for axially displacing said jet tube for the water within said jet tube for the secondary air, wherein the distance between the end of the water jet relative to the end of the air jet is adjustable;

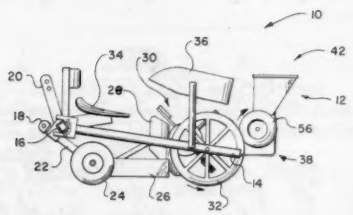
whereby oxidation of the combustible, volatile constituents in said flue gases occur, said gases are precooled and their dew point is raised.

4,080,911

FERTILIZER DISTRIBUTOR ATTACHMENT FOR A TRANSPLANTER

C. Albert Gregory, and R. Lane Gregory, both of Rte. 2, Angier, N.C. 27501

Filed Nov. 15, 1976, Ser. No. 741,883
Int. Cl.[2] A01C 5/00; G01F 13/00
U.S. Cl. 111—36 4 Claims



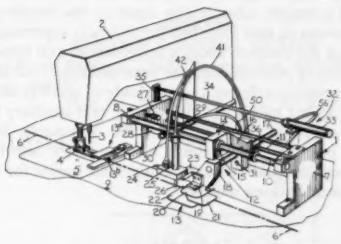
1. A fertilizer distributor attachment adapted to be mounted and powered by a mechanical transplanter of the type having a main frame, plant setting means for depositing plants in an open furrow, and ground engaging furrow closing wheel means rotatively mounted to said main frame, said fertilizer distributor attachment as properly mounted on said transplanter comprising: mounting frame means adapted to be connected to said main frame of said transplanter; support frame means secured to said mounting frame means; a hopper assembly secured to said support frame means and including a lower material distributing opening formed therein and agitating means including at least one shaft extending interiorly through said hopper assembly and rotatively mounted therein; means associated with said hopper assembly for generally directing the flow of material from said hopper to the desired area of application; friction wheel drive means operatively connected to said agitating means and adapted to frictionally engage said furrow covering wheel means when said fertilizer distributor attachment is mounted on said transplanter for driving said agitating means disposed within said hopper assembly in response to said transplanter traversing a field during the transplanting operation, said friction wheel drive means including a drive wheel secured on a drive wheel support shaft supported by said fertilizer distributor attachment and wherein said drive wheel is oriented relative to said mounting frame means of said fertilizer distributor attachment such that said drive wheel is adapted to align with and frictionally engage said furrow wheel closing means of said transplanter when said fertilizer distributor attachment is properly mounted on said transplanter; and interconnecting drive means operatively interconnected between said friction wheel drive means and said agitating means for driving said agitating means in response to said drive wheel of said friction wheel drive means being driven.

4,080,912

WORKPIECE GUIDE FOR SEWING UNITS

Nerino Marforio, Milan, Italy, assignor to Rockwell-Rimoldi S.p.A., Milan, Italy

Filed Mar. 8, 1977, Ser. No. 775,605
Claims priority, application Italy, Mar. 11, 1976, 21070A/76
Int. Cl.[2] D05B 21/00
U.S. Cl. 112—121.15 9 Claims



1. A workpiece guide for a sewing unit of the type including a work bed plate with a sewing machine operatively associated therewith having a needle and feeding mechanisms defining a sewing axis along which pieces of fabric having acc ories such as pockets, belts and the like are advanced to the stitching instrumentalities, said workpiece guide comprising:

(a) a carriage member (12) mounted on the work bed plate for sliding movement parallel with the sewing axis:

(b) a fabric guide (13) attached to said carriage member (12) and movable therewith between loading and operating positions, said fabric guide having plate members (20, 21, 22) disposed one above the other to define channels for separately guiding the individual pieces of fabric forming the workpiece;

(c) means supported by said carriage member (12) for gripping and holding the pieces of fabric within their respective channels during advance of the workpiece to the stitching instrumentalities;

(d) a control device (40) operatively connected to and for actuating said gripping and holding means;

(e) a first control means (44, 46) connected to said control device for activating the latter at the beginning of the

work cycle to effect actuation of said gripping and holding means; and

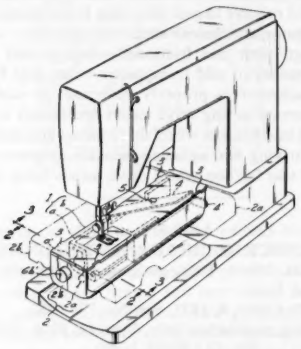
(f) a second control means (**27, 49**) operatively connected to said control device for deactivating said gripping and holding means upon arrival of said fabric guide (**13**) at said operating position.

4,080,913

SWING-OPEN CONVERTIBLE ARM FOR SEWING MACHINE

Joseph M. Arendash, Rocky River, Ohio, and Yuji Okui, Osaka, Japan, assignors to White Sewing Machine Company, Cleveland, Ohio

Filed Feb. 2, 1977, Ser. No. 764,888
Int. Cl.[2] D05B *75/00*
U.S. Cl. 112—258 **10 Claims**



1. A sewing machine having a free arm comprising a fixed bed having an upper surface, at least one auxiliary bed extending longitudinally along one side of the fixed bed, said auxiliary bed having a length substantially equal to the length of the fixed bed, means on said fixed bed for pivotally supporting said auxiliary bed for rotation about a longitudinal axis between a work-supporting position coplanar with said upper surface and a retracted position defining a vertical side of said free arm first releasable locking means for maintaining said auxiliary bed in said work-supporting position, second releasable locking means for positively maintaining said auxiliary bed in said retracted position, and manually engageable means for releasing said second locking means.

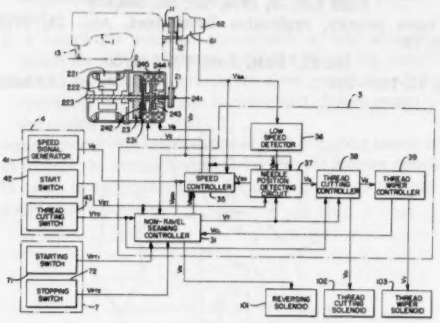
4,080,914

SEWING MACHINE WITH IMPROVED NON-RAVEL SEAMING CONTROLLER

Giichi Ishida, and Masayoshi Sunada, both of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Sep. 22, 1976, Ser. No. 725,631
Claims priority, application Japan, Sep. 23, 1975, 50-115030
Int. Cl.[2] D05B *69/18, 69/20*
U.S. Cl. 112—277 **15 Claims**

1. A control circuit for controlling the rotating speed of a clutch and brake motor of a sewing machine capable of performing non-ravel seaming at the start and the end of a sewing operation comprising start switch means for generating a start signal indicating the start of said sewing operation, first speed signal generator means for generating a signal representing the actual speed of said clutch and brake motor, needle position detector means for generating a needle position signal at each reciprocation of the needle, second speed signal generator means for generating a desired speed signal, operator controlled thread cutting switch means for generating a thread cutting signal, speed control means for controlling the speed of said clutch and brake motor by comparing the desired speed signal from said second speed signal generator means and the actual speed signal from said first speed signal generator means, and a non-ravel seaming controller which comprises first means for enabling said non-ravel seaming for a first predetermined duration subsequent to receipt of said start signal from said start switch means, and second means for generating a medium speed signal no greater than a predetermined level



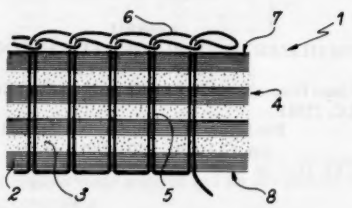
less than a normal speed at a predetermined time after the receipt of said thread cutting signal and applying said medium speed signal to said speed controller for controlling the speed of said clutch and brake motor in accordance therewith and for enabling said non-ravel seaming for a second predetermined duration at the end of said sewing operation.

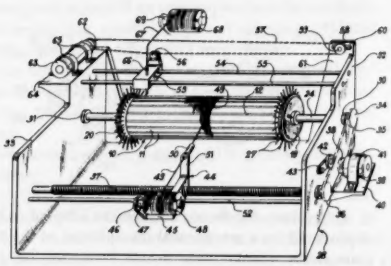
4,080,915

METHOD OF AND APPARATUS FOR THE PRODUCTION OF BODIES OR PARTS OF THREE-DIMENSIONAL FABRIC

Bruno Bompard, Villeurbanne; Jean Brochier, and Alain Bruyere, both of Lyon, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Jun. 22, 1976, Ser. No. 698,700
Claims priority, application France, Jun. 26, 1975, 75 20117
Int. Cl.[2] B65H *81/00;* **D05B** *93/00*
U.S. Cl. 112—412 **16 Claims**





7. A body of three-dimensional fabric comprising a plurality of layers of yarns which are substantially parallel, a stack of at

least two of said layers in which the yarns are parallel and oriented differently from one layer to the next, said layers being transversely interconnected by at least one tensioned sewing yarn which extends through said layers in straight lines with flattened loop portions, crests of said loop portions being situated on the faces of the stack, the first of said layers comprising a continuous yarn disposed along a circumferential helix, the second of said layers being superimposed on said helix in a substantially axial direction and covering said first layer, a third layer identical to said first layer covering said second layer, a fourth layer identical to said second layer covering said third layer and so on, said at least one sewing yarn extending in said axial direction.

4,080,916

MARITIME PLATFORM ASSEMBLIES

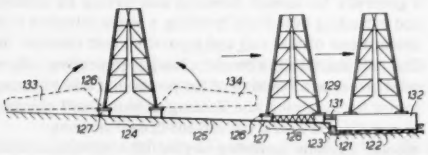
Vladimir Nastasic, Leven, Scotland; Frode Johan Hansen, Kingswood, England; Donald Miller Watson, Leven, Scotland, and David William Manton, Bedford, England, assignors to Redpath Dorman Long (North Sea) Limited, Bedford, England

Continuation of Ser. No. 595,602, Jul. 14, 1975, abandoned. This application Feb. 16, 1977, Ser. No. 769,293

Claims priority, application United Kingdom, Jul. 23, 1974, 32513/74; Nov. 15, 1974, 4126/74

Int. Cl.[2] B63B *9/00*

U.S. Cl. 114—65 R **5 Claims**



1. A method of fabricating a maritime platform assembly comprising the steps of stabilizing a foundation raft on a support alongside a fixed quay, translationally moving at least substantially the whole of an erect tower structure from land adjacent the quay onto the foundation raft, securing the tower structure to the foundation raft, and then floating the assembly so formed off and away from the support, in which method the tower structure was previously made by the steps of constructing two side frame elements on the ground with their bases occupying their respective places on the planform of the completed tower, and then raising the side frame elements to a generally vertical position by pivotal action about their respective bases, and joining adjacent edges of the side frame elements.

4,080,917

ROLLER FURLING MECHANISM

Hobart Laidlaw Alter, Capistrano Beach, and Jerald Wayne Blakely, Dana Point, both of Calif., assignors to Coast Catamaran Corporation, Irvine, Calif.

Filed May 2, 1977, Ser. No. 792,806

Int. Cl.[2] B63H *9/04*

U.S. Cl. 114—106 **8 Claims**

1. Apparatus for furling the jib of a catamaran sailboat having a forestay supporting the luff of the jib and connected at an upper end by a swivel connection to a mast of the sailboat, said forestay being attached at its lower end to first and second hulls of said sailboat by means of first and second bridle wires respectively, the improvement comprising: a housing means including link means joining said bridle wires together to form a bridle junction; roller means rotatably mounted in said housing means beneath said bridle junction; torque-transmitting connection means for connecting said roller means to the

lower end of said forestay; and means for rotating said roller means to thereby turn said forestay and furl said jib.

4,080,918

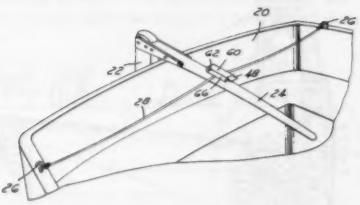
RUDDER CONTROL DEVICE

Robert Bruce Bonhard, 23230 Tireman Ave., Dearborn Heights, Mich. 48127

Filed Jul. 23, 1976, Ser. No. 707,953

Int. Cl.[2] B63H *25/00*

U.S. Cl. 114—172 **10 Claims**



1. In combination for controlling a boat which comprises:

(a) a movable tiller bar for controlling rudder position on a boat,

(b) an elongate base for a tiller control device mounted on said tiller bar, said base having a transverse open topped channel having a reentrant groove to guide a tiller line across the base,

(c) a latch member manually movable to and from a latching position at one end of said base plate,

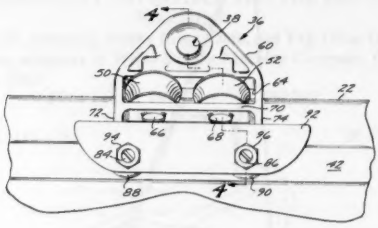
(d) a clamping cap hinged to said base on an axis spaced from said latch having means to engage a portion of said line in said channel to lock it against lateral movement relative to said base, and

(e) means on said cap to engage said latch to retain said cap in latched position until manually released.

4,080,919
SAILBOAT TRAVELER APPARATUS

Andrew MacDonald Holland, and Henry Leyva Arce, both of San Juan Capistrano, Calif., assignors to Coast Catamaran Corporation, Irvine, Calif.

Filed Jul. 26, 1976, Ser. No. 708,573
Int. Cl.[2] B63H 9/08
U.S. Cl. 114—204 13 Claims

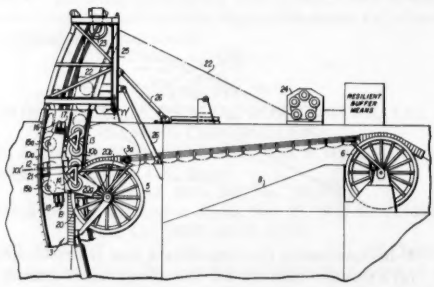


1. A traveler apparatus, comprising:
an elongated track having a substantially circular cross section, said track having a portion of its circumference open along its length; and
a traveler carriage including a pair of bearings rotatably mounted on axles, said bearings having substantially circular cross sections along the axes of their axles and being mounted on said carriage and adapted to be received within said track with said axles of said bearings, extending through said open portion, said traveler carriage thereby being pivotal about the centerline of said track.

4,080,920
TOWING APPARATUS

Jean-Pierre Berthet; Jean-Guy Cailloux, and Philippe Clement, all of Six Fours les Places, France, assignors to Etat Francais represente par le Delegue Ministeriel pour l'Armement, France

Filed Oct. 4, 1976, Ser. No. 728,898
Claims priority, application France, Nov. 6, 1975, 75 33896
Int. Cl.[2] B63B 21/16
U.S. Cl. 114—244 10 Claims

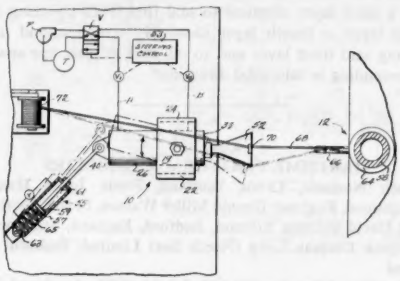


1. Device for hauling or towing an immersed body from a ship having a vertical central well defined by two vertical lateral walls and by a rear wall and a front wall extending through said ship said device comprising:
a carriage movable in said well during the towing;
means for mounting said carriage in said well and for compelling it to follow a determined travel path during the towing including slideways fixed on each of said lateral walls;
a first pulley mounted on said carriage; and
a traction cable passing over said pulley and adapted to be connected to said immersed body.

4,080,921
UNIVERSAL COUPLING SYSTEM

Werner F. J. Freitag, Driefontein, South Africa, assignor to SBT Development Corporation, Baltimore, Md.

Filed Aug. 12, 1976, Ser. No. 713,993
Claims priority, application South Africa, Aug. 22, 1975, 75/5386
Int. Cl.[2] B63B 21/56
U.S. Cl. 114—249 9 Claims



1. A coupling system for interconnecting first and second objects so as to permit at least limited freedom of movement in three axes — pitch, yaw and roll — comprising:
a first element including a housing enclosing a fluid-tight inner chamber, a rod member movable in said housing in a generally horizontal direction and having an outboard end extending out of said housing, a piston attached to the inboard end of said rod and separating said chamber into first and second sub-chambers having respective volumes which vary as a function of the position of said piston and means for mounting said housing to one of said objects to permit limited lateral movement of said housing;
a second element including a pair of concentric tubular members movable with respect to each other in a vertical direction, means for connecting one of said tubular members to the other of said objects and means for connecting the other of said tubular means to said outboard end;
means coupled to said sub-chambers for supplying a fluid thereto; and
means connecting the end of said housing remote from the outboard end of said piston to said one object for damping lateral movement of said housing including a damping housing defining a piston chamber, a piston mounted for movement in said piston chamber and dividing said piston chamber into first and second piston sub-chambers, means for permitting controlled movement of fluid between said piston sub-chambers, a spring in one of said piston chambers for returning said damping piston to an initial position and means for pivotably connecting said damping piston to said housing of said first element.

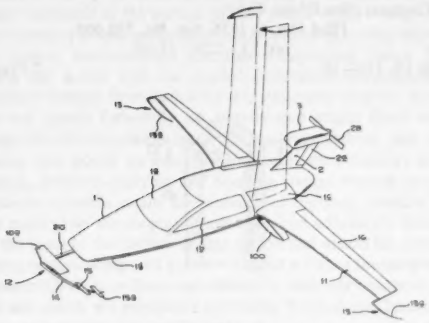
4,080,922
FLYABLE HYDROFOIL VESSEL

Curtis M. Brubaker, 11400 Chenault St., Los Angeles, Calif. 90049

Continuation-in-part of Ser. No. 611,158, Sep. 8, 1975, abandoned. This application Oct. 6, 1976, Ser. No. 730,013
Int. Cl.[2] B63B 1/30
U.S. Cl. 114—282 26 Claims

18. In an airborne vehicle,
(a) a forwardly extending hull having left and right sides, the hull being forwardly movable,
(b) left and right wings carried by the hull, and
(c) water level feeler struts carried to pivot up and down at the outboard ends of the wings, the wings having swingable roll control flaps connected with said feeler struts

whereby pivoting of the struts in response to contact with the surface of a body of water effects swinging of the flaps



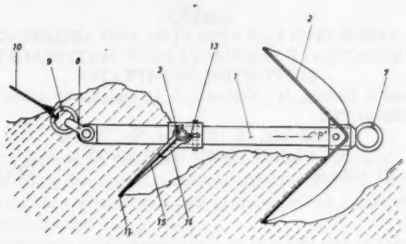
to control roll of the vehicle about its longitudinal axis and establish a level attitude of the vehicle.

4,080,923

ANCHOR WITH PIVOTAL SECONDARY FLUKES

Hanns Stinnes, Muelheim-Ruhr, Germany, assignor to Margrete Stinnes, Jackson Heights, N.Y.

Filed Sep. 24, 1976, Ser. No. 726,423
Claims priority, application Germany, Sep. 30, 1975, 2543559
Int. Cl.[2] B63B *21/24*
U.S. Cl. 114—304 **13 Claims**



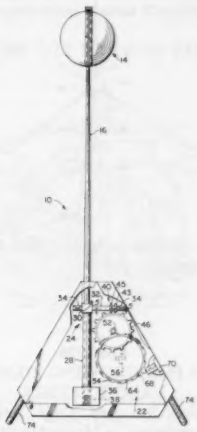
1. An anchor comprising:
a shank having a crown end and a ring end;
a pair of main flukes fixed at said crown end to said shank, generally lying in a fluke plane including said shank, and immovable relative to said shank;
a stock on said shank between said ends thereof and having a pair of arms extending oppositely from said shank, normally fixed rigidly on said shank, and lying generally in a stock plane generally perpendicular to said fluke plane and including said shank;
a secondary fluke pivotal on each of said arms between a pair of extreme positions forming an acute angle with said stock plane and through a central position in said stock plane, said secondary flukes being pivotal independently of each other and pointing generally toward said ring end in said extreme and central positions; and
means including abutments on said arms engageable with said secondary flukes and defining therefor said extreme positions.

4,080,924

WARNING SIGNAL DEVICE

William LeClaire, 10359 Carrolwood La., Tampa, Fla. 33618

Filed Sep. 16, 1976, Ser. No. 723,908
Int. Cl.[2] B60Q *1/52*
U.S. Cl. 116—28 R **9 Claims**



1. A signal device comprising:
a base;
a removable elongated pole;
mounting means in said base for pivotally mounting said pole at a pivot point to said base said mounting means comprising an elongated sleeve member for telescopically mounting said pole therein and a mounting shaft positioned substantially perpendicularly with respect to said pole and pivotally mounted in said base, said sleeve member being mounted to and pivotable about the longitudinal axis of said mounting shaft;
a signal means mounted at one end of said pole;
motor means in said base for displacing said mounting means about said pivot point from an equilibrium position;
a counterweight secured to said elongate sleeve member distally from said pivot point for returning the displaced mounting means to the equilibrium position; and
means for removably securing said pole in said sleeve member.

4,080,925

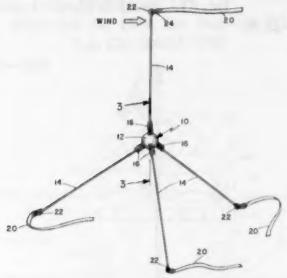
PORTABLE SURFACE WIND INDICATOR

Robert Edwin Moore, Lakeside, Calif., assignor to General Dynamics Corporation Electronics Division, San Diego, Calif.

Filed Mar. 14, 1977, Ser. No. 777,023
Int. Cl.[2] G01F *15/00*
U.S. Cl. 116—117 R **9 Claims**

1. A portable surface wind indicator comprising:
a central body member,
four elongated arms mounted on and extending outwardly from said central body member at equal angles of 120° between any two of said elongated arms, and

wind responsive indicating means mounted on the outer end of each of said elongated arms for extending outwardly



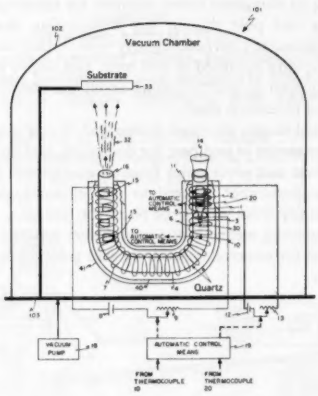
therefrom in response to wind acting thereon for indicating wind direction.

4,080,926

APPARATUS FOR GROWING FILMS BY FLASH VAPORIZATION

Nicolaos S. Platakis, San Jose, Calif., and Harry C. Gatos, Weston, Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Division of Ser. No. 573,240, Mar. 30, 1975. This application Nov. 22, 1976, Ser. No. 744,000
Int. Cl.² C23C *13/12*
U.S. Cl. 118—5 **6 Claims**



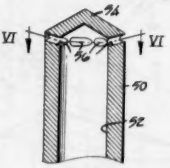
1. Apparatus for making films composed of a feed material whose constituents have different vapor pressures upon a substrate appropriately positioned with respect to the apparatus, that comprises: an ampoule whose only outlet is a capillary tube oriented downward, means for creating a temperature within the ampoule sufficient to melt said constituents which emit from the downwardly oriented capillary tube, means to control the level of said temperature, means for creating a controlled high-temperature environment into which the constituents emit that is well above the melting point of the constituent of the feed material having the highest melting point, and means to determine when the temperature of the environment is at some predetermined level and to provide a signal that is connected to said means to control, thereby to effect heating of the ampoule to create a melt therein, the molten constituents being emitted from the end of the capillary tube and being quickly vaporized within the heated environment.

4,080,927

FLUIDIZED BED-GAS COATER APPARATUS

Lloyd C. Brown, San Diego, Calif., assignor to General Atomic Company, San Diego, Calif.

Filed Oct. 6, 1976, Ser. No. 730,000
Int. Cl.² C23C *13/08*
U.S. Cl. 118—48 **7 Claims**



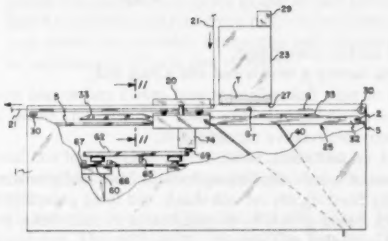
1. In gas coating apparatus for coating particles with a substance contained in a reactant gas while the particles are suspended in a fluidized bed, the apparatus including means defining a coating chamber for containing the particles to be coated and a floor for the coating chamber, and gas feed means at said floor to effect said fluidization, the improvement comprising an elongated nozzle extending substantially upwardly from and centrally of the chamber floor for introducing reactant gas into the coating chamber, the nozzle being closed at its upper end, an annular portion of the nozzle adjacent its upper end forming a plurality of outwardly directed, circumferentially spaced apart outlet passages for introducing the reactant gas into the coating chamber to minimize deposition of material from the reactant gas on the upper end of the nozzle and to enhance particle distribution within the fluidized bed, said outlet passages being angled upwardly and outwardly and being radially offset with respect to any plane extending radially from the longitudinal axis of the nozzle whereby to effect swirling of the reactant gas introduced into the coating chamber.

4,080,928

APPARATUS FOR APPLYING AND ADHERING PARTICULATE THERMOPLASTIC MATERIALS TO SUPPORTING SUBSTRATES

Hassel J. Savard, Jr., Neshanic, N.J., assignor to Atron, Inc., Rahway, N.J.

Filed Aug. 26, 1976, Ser. No. 717,882
Int. Cl.² B05C *13/00, 19/00*
U.S. Cl. 118—59 **19 Claims**



1. Apparatus for applying and adhering particulate thermoplastic materials to supporting substrates, such as medallions, appliques, patches and like goods which comprise: a relatively stationary support; means for placing the goods on said relatively stationary support at a loading station thereof; intermittantly operable transporting means for lifting said goods from said relatively stationary support, moving said goods forwardly by step-by-step stages from said loading station, and

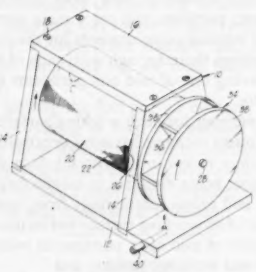
replacing said goods on said relatively stationary support at a particulate thermoplastic materials applying station thereof; intermittantly operable means for applying particulate thermoplastic materials to the surface of said goods while said goods are stationary at said particulate thermoplastic materials applying station; intermittantly operable transporting means for lifting said goods with the applied particulate thermoplastic materials thereon from said relatively stationary support, moving said goods forwardly by step-by-step stages from said particulate thermoplastic materials applying station, and replacing said goods on said relatively stationary support at a heating, pressure-applying and bonding station thereof; intermittantly operable means for heating and applying pressure to said particulate thermoplastic materials and adheringly bonding the same to the surface of said goods; and means for disengaging or separating said goods with said adhered thermoplastic materials thereon from said relatively stationary support so that said goods are positioned forwardly beyond said heating, pressure-applying and bonding station.

4,080,929

METHOD AND APPARATUS FOR BROODING FISH

Ronald W. Millnitz, Box 403, Culver City, Calif. 90230

Filed Sep. 7, 1976, Ser. No. 720,609
Int. Cl.[2] A01K *61/00*
U.S. Cl. 119—3 **14 Claims**



10. A method for brooding fish, including the steps of positioning fish eggs in a non-watertight container;
placing the container in a tank of water having a controlled environment;
continuously rotating the container at a low rate of speed.

4,080,930

BIVALVE MOLLUSCS REARING PROCESS

Gary David Pruder, Lewes, and Earl Elwood Greenhaugh, Rehoboth, both of Del., assignors to University of Delaware, Newark, Del.

Filed Jan. 25, 1977, Ser. No. 762,293
Int. Cl.[2] A01K *61/00*
U.S. Cl. 119—4 **8 Claims**

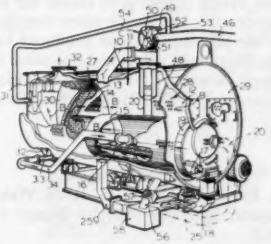
1. In a process of growing commercially desirable bivalve molluscs in an aqueous medium containing algae in an amount of at least 2×10^5 cells/ml, the improvement which comprises maintaining said aqueous medium at a temperature within the range of 25° to 32° C while periodically adding algae to a concentration of 1×10^6 cells/ml.

4,080,931

APPARATUS FOR FEEDING SOLID FUEL TO A FURNACE GRATE

Reginald Dennis Northcote, Lower Penn, and Frank William Osborne, Coseley, both of England, assignors to Parkinson Cowan GWB Limited, Dudley, England

Filed Sep. 17, 1976, Ser. No. 724,179
Claims priority, application United Kingdom, Sep. 20, 1975, 38695/75
Int. Cl.[2] F22B *7/12;* **F23K** *3/00;* **F23J** *15/00*
U.S. Cl. 122—149 **3 Claims**



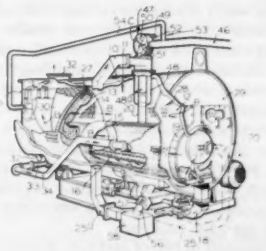
1. A shell boiler comprising an outer continuous shell within which is contained the water space of the boiler, a furnace having a roof, and a plurality of smoke tubes for passage therethrough of the products of combustion of the furnace and the boiler having apparatus for feeding solid fuel to the furnace downwardly through the water space of the boiler, said apparatus comprising a conduit extending downwards through the roof of the furnace, means for feeding solid fuel to the conduit above the lower end thereof, said means including at least one fuel propulsion element and drive means to cause the element to move to propel the fuel in a desired direction, and means to cause a rapid deceleration in the movement of the element whereby any fuel adhering to the element is flung therefrom, and a pneumatic fuel feed pipe extending from a source of fuel supply towards the conduit along which fuel is fed by air under pressure and a vent means whereby the pneumatic feed air is vented from the fuel feed pipe at a position adjacent to and upstream of the position of connection between the fuel feed pipe and the conduit.

4,080,932

INDUSTRIAL BOILERS

Reginald Dennis Northcote, Lower Penn, England, assignor to Parkinson Cowan GWB Limited, Dudley, England

Filed Sep. 17, 1976, Ser. No. 724,180
Claims priority, application United Kingdom, Sep. 20, 1975, 38697/75
Int. Cl.[2] F22B *7/12;* **F23C** *1/10, 1/12;* **F23J** *3/00*
U.S. Cl. 122—149 **6 Claims**



1. An industrial boiler installation comprising an outer continuous shell within which is contained the water space of the

boiler, a furnace, and a plurality of smoke tubes for passage therethrough of the products of combustion of the furnace, and the boiler having at least two fuel supply means, at least one of which extends through the shell and the water space, one of the fuel supply means supplying HCV fuel to the furnace and the other supplying LCV fuel to the furnace, the boiler including primary fuel supply means operative normally to fire the boiler and an auxiliary fuel supply means operative to supply non-corrosive fuel to fire the boiler and control means to render the primary fuel supply means inoperative and auxiliary fuel supply means operative prior to the boiler being placed in a "low load" condition, wherein the control means includes a pressure sensitive device operative to render the primary fuel supply means inoperative and the auxiliary fuel supply means operative when the pressure of steam produced by the boiler attains a first predetermined value, and operative to place the auxiliary fuel supply means in a "low load" condition when the pressure attains a second, higher predetermined value.

4,080,933

HEATED ENCLOSURES

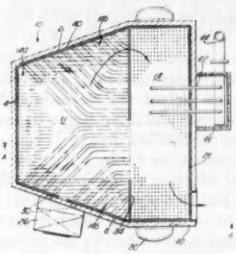
Thomas Gibson, Barnet, and Roger W. Hillis, Woking, both of England, assignors to Foster Wheeler Energy Corporation, Livingston, N.J.

Filed Sep. 30, 1976, Ser. No. 727,905

Claims priority, application United Kingdom, Sep. 19, 1975, 38596/75

Int. Cl.² F22B *21/34*

U.S. Cl. 122—336 **2 Claims**



1. A marine boiler comprising

a. a furnace section including front and side walls, roof and floor, said walls, roof and floor including rigidly united fluid cooled tubes, said front wall tubes extending from their upper ends to form a central section of said roof and extending from their lower ends to form a central section of said floor, some of said side wall tubes extending from their upper ends to form end sections of said roof and extending from their lower ends to form end sections of said floor, the remaining side wall tubes extending from their upper ends below and parallel to said roof tubes and extending from their lower ends above and parallel to said floor tubes,

b. a steam and water drum adjacent said roof, said roof tubes and said tubes extending below and parallel to said roof tubes being connected to said steam and water drum,

c. a water drum adjacent said floor, said floor tubes and said tubes extending above and parallel to said floor tubes being connected to said water drum,

d. a convection section adjacent said furnace section and including a plurality of rigidly united fluid cooled tubes extending between said water drum and said steam and water drum, said convection section together with said furnace section, water drum and steam and water drum defining a gas-tight enclosure,

e. a burner disposed in one of said side walls of said furnace section, and

f. a plurality of vapor generating tubes disposed within said enclosure and extending between said water drum and said steam and water drum, some of said tubes closest to said burner being rigidly united and defining a baffle extending part of the way across said furnace section.

4,080,934

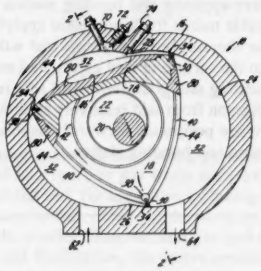
ROTARY ENGINE WITH INSERTS IN ROTOR FACES

Charles Jones, Hillsdale, N.J., assignor to Curtiss-Wright Corporation, Wood-Ridge, N.J.

Filed Sep. 9, 1976, Ser. No. 721,674

Int. Cl.² F02B *55/14*

U.S. Cl. 123—205 **4 Claims**



1. A rotor for a rotary combustion engine, said rotor comprising:

(a) a main portion having a generally polygonal profile such that said rotor has a plurality of circumferentially spaced apex portions and a plurality of working surfaces with each working surface of said rotor extending between adjacent apex portions, said rotor main portion having a plurality of internal compartments for the circulation of a cooling medium therethrough with each of the rotor apex portions having one of said compartments disposed adjacent thereto;

(b) an insert member for each working surface of said rotor with each insert member having a depression between its ends to form a recess in its working face and with each insert member being elongate to extend circumferentially beyond its said recess substantially from one apex portion to the other of its working surface but terminating short of the apex seals of said apex portions to overlie the major portion of said working surface; and

(c) means securing each insert member to the rotor so as to leave a gap between the major portion of the facing surfaces of said insert and rotor and to permit circumferential thermal expansion and contraction of the major portion of said insert member relative to the rotor.

4,080,935

ROTARY INTERNAL COMBUSTION ENGINE

Leonard Olson, 107 W. Cheyenne Rd., Colorado Springs, Colo. 80906

Filed Jun. 4, 1976, Ser. No. 692,642

Int. Cl.² F02B *53/00*

U.S. Cl. 123—205 **12 Claims**

1. An internal combustion engine of the rotary type comprising:

a housing having a cavity therein with parallel flat end walls, a portion of said cavity being of right cylindrical configuration,

a power shaft extending through said housing and mounted for rotation about the axis of said cylindrical portion,

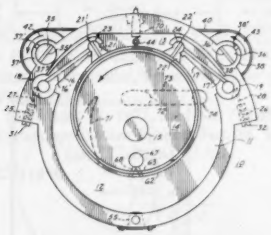
a cylindrical rotor rigidly and eccentrically mounted on said shaft for rotation about the axis of said cylindrical portion with its ends in sealing engagement with said end walls of said cavity, the throw or lobe of said eccentric rotor being slightly less than the radius of said cylindrical portion of said cavity whereby said rotor moves in closely spaced

relationship, but does not touch, said cylindrical portion during a predetermined part of each revolution,

a pair of barrier partitions each pivotally mounted on the inner wall of said housing along one edge and slidably engaging said rotor along its opposite edge and cooperating with said rotor to divide said cavity to provide a combustion chamber and an air pumping chamber, said cylindrical portion of said cavity being in the air pumping chamber, said opposite edges providing sliding seals between said combustion and air pumping chambers,

means for biasing said opposite edges of said partitions into engagement with said rotor,

said rotor during movement adjacent said cylindrical portion dividing said air pumping chamber to provide an air intake chamber and an air compressing chamber,



said opposite rotor engaging edges of said barrier partitions being positioned to apply the force of high pressure in the combustion chamber against said rotor and thereby utilizing the eccentricity of said rotor to drive said shaft,

means for supplying fuel and air to said combustion chamber to provide a combustible mixture, said means including means for supplying the air from said air compressing chamber,

means for igniting the fuel and air mixture,

means for providing at least one exhaust passage for discharging burnt gases from said combustion chamber, and

said air supplying means utilizing said exhaust passage means and air from said compressing chamber for purging burnt gases from said combustion chamber.

4,080,936

ENGINE MOISTURE INDUCTION SYSTEM

Thomas K. Penland, 101 Runnels Ave., Long Beach, Mich. 39560

Filed Oct. 8, 1976, Ser. No. 730,735
Int. Cl.[2] F02D *19/00*
U.S. Cl. 123—25 A **7 Claims**

1. An apparatus for adding moisture to the charge of an internal combustion engine comprising:

chamber means capable of holding liquids and a liquid air mixture;

air exit means penetrating the chamber in proximity to its uppermost surface and capable of connection to an intake manifold of an internal combustion engine;

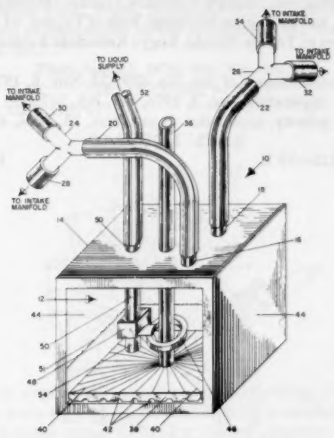
air intake means penetrating the chamber means;

manifold means located in close proximity to the lowest surface of the chamber means, connected to and capable of receiving air from the air intake means and distributing air only to several exit points in close proximity to the periphery of the intersection of the lowest surface of the chamber means, and the lowermost portions of the vertical walls of the chamber means;

liquid intake means penetrating a surface of the chamber and capable of connection to an external liquid supply;

valve means connected to and controlling flow of liquid through the liquid intake means; and

float means, attached to and controlling the valve means, actuated by the upper surface of the liquid contained in the chamber means centered in the horizontal plane of the



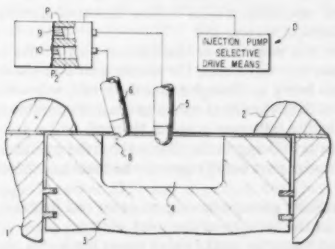
chamber as remote as possible from the air manifold exit points.

4,080,937

AIR-COMPRESSING FOUR-CYCLE INTERNAL COMBUSTION ENGINE WITH DIRECT FUEL INJECTION

Gerhard Wolters, Gaggenau, Germany, assignor to Daimler-Benz Aktiengesellschaft, Germany

Filed Mar. 26, 1976, Ser. No. 670,906
Claims priority, application Germany, Mar. 27, 1975, 2513587
Int. Cl.[2] F02B *3/06;* **F02M** *61/14*
U.S. Cl. 123—32 G **9 Claims**

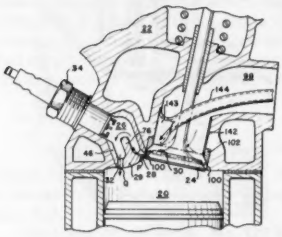


1. An air-compressing four-cycle internal combustion engine with direct fuel injection, which comprises a first injection valve means for injecting fuel supplied from a first injection pump into a combustion space means only when the internal combustion engine is operated in highway traffic, said first injection valve means being so designed as regards construction and arrangement that an optimal output of the internal combustion engine is attainable with favorable fuel consumption, characterized in that a second injection valve means is provided for injecting fuel supplied from a second injection pump into the combustion space means, said second injection valve means being so designed as regards construction and arrangement thereof that low combustion noises are achieved without regard to an output of the internal combustion engine and a consumption of the fuel, and in that means are provided for selectively operating said second injection valve means in lieu of said first injection valve means such that only the second injection pump is effective when the internal combustion engine is operated in city traffic.

4,080,938
COMBUSTION APPARATUS FOR AN INTERNAL COMBUSTION ENGINE

Masaaki Noguchi, Nagoya; Yukiyasu Tanaka, Okazaki; Setsuro Sekiya, and Katsuhiko Motosugi, both of Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Continuation-in-part of Ser. No. 629,233, Nov. 6, 1975. This application Dec. 3, 1976, Ser. No. 747,215
Claims priority, application Japan, Nov. 13, 1974, 49-130007
Int. Cl.[2] F02B *23/00*
U.S. Cl. 123—75 B **12 Claims**



1. In an internal combustion engine having a main combustion chamber defined by a cylinder, a cylinder head and a piston, an auxiliary combustion chamber having an inlet and an outlet port through which the auxiliary combustion chamber communicates with the main combustion chamber, an intake port disposed in the cylinder head for supplying a first air/fuel mixture to the main combustion chamber, an auxiliary passage disposed in the intake port for supplying a second air/fuel mixture, an intake valve operably disposed in the intake port for controlling the flow of the air/fuel mixtures, and an ignition spark plug positioned in the auxiliary combustion chamber, the improvement comprising:

a cylindrical recess disposed in the cylinder head which recess connects with the intake port, the diameter of the cylindrical recess being sufficiently large that the intake valve smoothly moves within the axial direction of the cylindrical recess; and

a valve seat disposed at the deepest part of the cylindrical recess, the valve seat, the intake port and the cylindrical recess being so arranged that the intake valve moves fully out of the cylindrical recess in the main combustion chamber at the full open position thereof,

the inlet port being in the side wall of the cylindrical recess, the outlet port being open to the main combustion chamber,

the auxiliary passage having an open end in the intake port and in the vicinity of the inlet port,

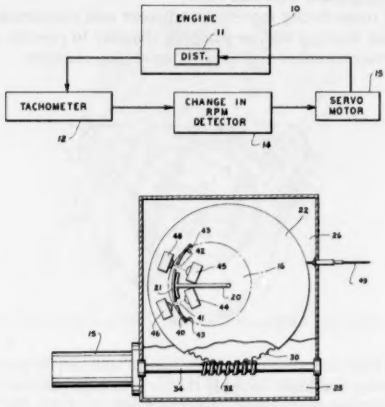
wherein when the intake valve opens but is still positioned in the cylindrical recess, the second air/fuel mixture is deflected by the back face of the intake valve so as to be conducted substantially through the inlet port into the auxiliary combustion chamber.

4,080,939
TIMING CONTROL APPARATUS FOR A COMBUSTION ENGINE

Bobby J. C. Love, 2585 Hatfield Cir., SE., Atlanta, Ga. 30316

Filed Mar. 22, 1976, Ser. No. 668,866
Int. Cl.[2] F02P *5/04*
U.S. Cl. 123—117 R **5 Claims**

1. Timing control apparatus for an engine including a tachometer for determining the engine r.p.m., said tachometer including a meter having a hand, a gate carried by said hand, a turntable generally parallel to the plane of motion of said hand, a light source mounted on said turntable on one side of said gate, a photoelectric cell mounted on said turntable on the opposite side of said gate, the arrangement being such that a light beam passes from said light source to said photoelectric cell, said hand being movable in response to a change in engine r.p.m., movement of said hand causing said gate to break said light beam, a servo unit for changing the ignition timing of said engine, and circuit means responsive to the breaking of said light beam for operating said servo unit, said turntable being rotatable by said servo unit, a wall mounted on said turntable, said wall defining two openings therein closable by said gate, the apparatus being so constructed and arranged that motion of said gate in one direction causes said gate to block one of said openings, and motion of said gate in the opposite direction

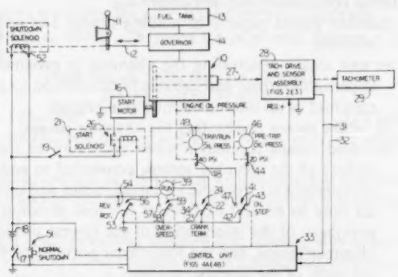


causes said gate to block the other of said openings, said light source being adjacent to one of said openings, said photoelectric cell being on the other side of said wall for receiving light from said light source, a second light source adjacent to said other of said openings, and a second photoelectric cell being on the other side of said wall for receiving light from said second light source, the arrangement being such that motion of said hand in one direction causes said gate to block said one opening and motion of said hand in the opposite direction causes said gate to block said other opening.

4,080,940
ENGINE CONTROL

Joe E. Fuzzell, Peoria, Ill., and Paul E. Turnquist, Lubbock, Tex., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Jun. 23, 1977, Ser. No. 809,344
Int. Cl.[2] F02P *5/04*
U.S. Cl. 123—117 D **43 Claims**



1. Apparatus for controlling the functioning of an engine comprising:

a shaft driven by said engine at a speed proportional to the engine speed,

means responsive to rotation of said shaft through a predetermined degree of rotational movement for generating a first signal at the beginning of such movement and a second signal at the end of such movement,

timer means for producing a timer signal of predetermined time duration,

means for starting said timer in response to generation of said first signal,

means for effecting a control function in response to time coincidence of said second signal and said timer signal.

4,080,941

DEVICE FOR RECYCLING THE EXHAUST GASES OF AN INTERNAL COMBUSTION ENGINE

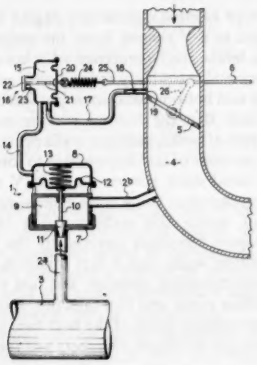
Bernard Bertrand, Vernouillet, France, assignor to Automobiles Peugeot, Paris, France

Filed Jan. 12, 1977, Ser. No. 758,858

Claims priority, application France, Jan. 16, 1976, 76 01047

Int. Cl.[2] F02M *25/06*

U.S. Cl. 123—119 A **5 Claims**



1. A device for recycling the exhaust gases of an internal combustion engine comprising an exhaust pipe of the engine, an induction pipe of the engine, a butterfly valve member in the induction pipe, a recycling passage putting the exhaust pipe in communication with the induction pipe, a valve for regulating the flow of the recycled gases and interposed in the recycling passage, between the exhaust pipe and the induction pipe, a suction take off orifice defined in the induction pipe of the engine, a suction capsule, a pipeline connecting the suction orifice to the suction capsule, the capsule having a movable wall subjected on one face to suction inside the capsule and on an opposite face to atmospheric pressure, said movable wall being connected to actuate said valve, a suction regulator comprising a chamber interposed in said pipeline, means defining an opening in the chamber for putting the chamber in communication with the atmosphere, a valve member cooperative with said opening, said chamber including a movable wall on which suction in the chamber acts, said movable wall operatively connected to said valve member, a mechanism connected to shift the butterfly valve member, a return spring connected to the mechanism at one end and to the movable wall of the chamber at an opposite end of the spring, the movable wall of the chamber being subjected to the suction in the chamber on one face and to the force exerted by said spring on an opposite face, the arrangement being such that the return force exerted by the spring increases with the opening of the butterfly valve member.

4,080,942

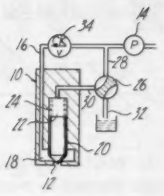
METERING FUEL BY COMPRESSIBILITY

Edward T. Vincent, Boca Raton, Fla., and George E. Cheklich, Bloomfield Hills, Mich., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 23, 1976, Ser. No. 699,140

Int. Cl.[2] F02M *47/02*

U.S. Cl. 123—139 AT **5 Claims**



1. In an engine fuel supply system comprising a fuel pump (14) and drain (48): an improved fuel injector mechanism comprising housing means forming a control chamber (22) and a fuel injection chamber (18) having a discharge orifice (12); a slidable needle valve (20) having a first end area exposed to the control chamber and a second end area exposed to the injection chamber, the end areas of the needle valve being approximately the same so that forces attributable to fuel pressure have negligible biasing effect on the valve when the control chamber and injection chamber are fully pressurized; spring means (24) biasing the needle valve in a direction wherein its second end areas closes the discharge orifice when both of the aforementioned chambers are pressurized; means defining a rigid non-elastic fuel storage chamber (32) continuously connected to the injection chamber; a first flow passage (44) within the housing means continuously connected to the aforementioned control chamber (22); an engine-programmed valve (26a) movable within the housing means to alternately connect the first flow passage (44) to the fuel pump or the drain; a second passage (50) connecting the aforementioned storage chamber to the first flow passage; and a check valve (34) in said second passage permitting flow from the first passage to the storage chamber but preventing backflow from the storage chamber to the first passage; the engine-programmed valve (26a) having a first position wherein pressurized fuel from the pump is delivered through the first passage (44) to the control chamber (22) and second passage (50), for thereby filling the fuel storage chamber (32) and injection chamber (18) with pressurized fuel; the spring means (24) being effective to bias the needle valve (20) to a position closing the discharge orifice (12) when said engine-programmed valve is in its first position; said engine-programmed valve having a second position wherein pressurized fuel is exhausted from the control chamber (22) through the first passage (44) to the drain (48), whereby the control chamber pressure is reduced to enable the injection chamber pressure to move the needle valve to a position opening the discharge orifice; the spring means developing a substantial force for thereby closing the needle valve while the injection chamber pressure is appreciably above atmospheric, whereby the time at which the needle valve closes is determined by pressure rather than the engine-programmed valve.

4,080,943

FUEL CHARGE ATOMIZING DEVICE

Virgil E. Carr, Rte. 1, Box 475, Eloy, Ariz. 85231, and Delbert E. Carr, 1317 E. Willetta, Phoenix, Ariz. 85006

Filed Aug. 26, 1976, Ser. No. 717,848

Int. Cl.[2] F02M *29/00*

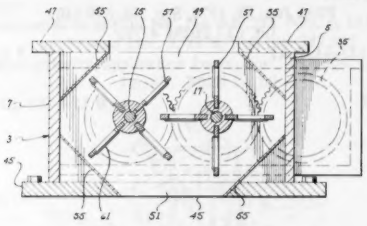
U.S. Cl. 123—141 **8 Claims**

1. In combination with the carburetor and intake manifold of

an internal combustion engine, a fuel charge atomizer operatively disposed therebetween comprising:

(a) a chamber having an inlet and outlet port and side walls;

(b) a pair of parallel rotatable axles disposed in said chamber



transversely to the flow of the fuel charge, said axles having radial vanes disposed in overlapping relationship between said axles;

(c) means for mounting said axles;

(d) means for rotating said vanes.

4,080,944

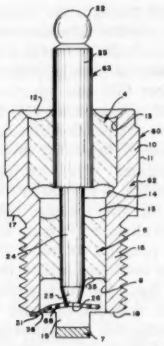
GLOW PLUG WITH IDLE BAR

Vasanth K. Bhat, Cincinnati; Allen E. Siegel, Loveland; Richard E. Vogel, and Larry G. Burrows, both of Cincinnati, all of Ohio, assignors to Emerson Electric Co., St. Louis, Mo.

Continuation-in-part of Ser. No. 594,560, Jul. 9, 1975. This application Jun. 16, 1976, Ser. No. 696,724

Int. Cl.[2] F23Q 7/10

U.S. Cl. 123—145 A **12 Claims**



1. In a glow plug igniter of the type used in small two-cycle internal combustion engines, having a hollow cylindrical casing and a central pin-terminal, the improvement comprising a substantially flat-spiral-coiled, flexible resistance element one end of which is electrically connected to said casing and the other to said pin-terminal, said element being oriented substantially perpendicularly to the axis of said pin-terminal and being free of support between the said pin-terminal and said casing, and an idle bar connected at its ends to said casing and spaced from said element in a direction away from said pin-terminal.

4,080,945

STRUCTURE OF V TYPE INTERNAL COMBUSTION ENGINE

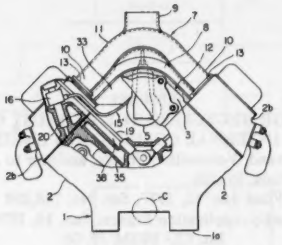
Noboru Hikosaka, Kamakura, and Isamu Yanagawa, Hiratsuka, both of Japan, assignors to Isuzu Motors Limited, Tokyo, Japan

Filed Aug. 9, 1976, Ser. No. 712,572

Claims priority, application Japan, Aug. 8, 1975, 50-96348; Sep. 2, 1975, 50-106207

Int. Cl.[2] F02F 7/00

U.S. Cl. 123—195 C **1 Claim**



1. In a V type internal combustion engine having a pair of banks arranged in a V shaped form, the improvement which comprises an intake duct composed of a bottom metal sheet portion and a metal sheet body formed with an intake passage, said body and said bottom metal sheet portion being coupled to each other such that the bottom portion covers the space between the pair of banks, partition walls provided on the front and rear end portions of said engine so as to form together with said bottom metal sheet portion and said V shaped banks, a soundproofing chamber, and a noise generating engine component mounted within said soundproofing chamber; further comprising tappet chambers covered by the bottom portion and said partition walls; and a fuel injection pump disposed within the soundproofing chamber and fuel pipes connecting the fuel injection pump and fuel injection nozzles disposed in the respective cylinder heads of the both banks, with said pipes extending through the tappet chambers and the cylinder heads.

4,080,946

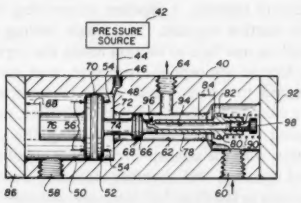
INTERNAL COMBUSTION ENGINE SHUT-DOWN CONTROL VALVE

Paul B. Cunningham, Pittsburgh, Pa., assignor to Lenmar Industries, Inc., Pittsburgh, Pa.

Filed Dec. 20, 1976, Ser. No. 752,252

Int. Cl.[2] F02B 77/00

U.S. Cl. 123—198 DB **5 Claims**



1. An internal combustion engine shut-down control valve of the type having fuel for powering said engine flowing through an internal valve opening therein that is normally spring-biased closed except as a piston therein is biased by the oil pressure of said engine through movement towards said internal valve opening for maintaining the same in an open condition, the improvement to said shut-down control valve comprising means of exerting a pressure within said engine

selected as a variable pressure source indicative of the operating requirement of said engine, and conduit means connected between said selected pressure exerting means and said movement path of said internal valve-opening piston so as to interpose the exerted pressure of the former in opposition to said valve-opening movement of the latter, whereby engine shutdown occasioned by the termination of fuel flowing through said internal valve opening is related to the exerted pressure of said selected pressure source and thus also to said engine operating speed.

4,080,947

APPARATUS AND METHOD FOR CONTROLLING IGNITION OF MULTI-CYLINDER INTERNAL COMBUSTION ENGINES WITH A PASSAGEWAY THAT BYPASSES THROTTLE VALVE

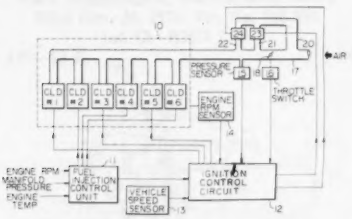
Haruhiko Iizuka, Yokosuka, Japan, assignor to Nissan Motor Company, Limited, Japan

Filed Dec. 6, 1976, Ser. No. 747,476

Claims priority, application Japan, Dec. 8, 1975, 50/146138

Int. Cl.[2] F02D *13/06*

U.S. Cl. 123—198 F **10 Claims**



1. Apparatus for controlling the ignition of the cylinders of a multi-cylinder internal combustion engine mounted on a roadway vehicle having an intake air passage, a throttle valve therein, means for supplying a mixture of air and fuel to each cylinder, and means for igniting the mixture supplied to each cylinder for combustion therein, comprising:

means for sensing an operating parameter of the engine indicative of the magnitude of a load exerted on said engine;

means for progressively varying the number of active cylinders to which the mixture is supplied in response to the sensed engine operating parameter;

means defining a passageway to said intake air passage to allow a portion of the intake air to bypass said throttle valve; and p1 means for controlling the amount of the air passing through said passageway in response to the decrease or increase in the number of said active cylinders.

4,080,948

SPLIT ENGINE CONTROL SYSTEM

John Dolza, Sr., 810 State St., Fenton, Mich. 48430

Filed Jan. 25, 1977, Ser. No. 762,361

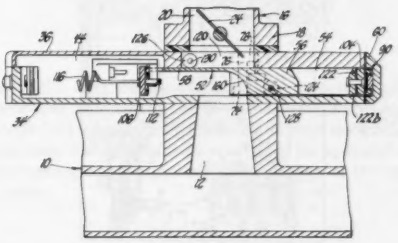
Int. Cl.[2] F02D *13/06*

U.S. Cl. 123—198 F **20 Claims**

1. A charge forming system for an internal combustion engine of the type comprising an intake manifold having first passage means communicating with one-half of the engine combustion chambers and second passage means communicating with the other half of the engine combustion chambers; an air metering mechanism having third passage means adapted to supply metered air to said first and second manifold passage means, and throttle valve means for controlling the flow of metered air through said air metering mechanism passage means; and a control device for interrupting the flow of metered air to said first manifold passage means whereby engine output power is generated only by those engine combustion chambers supplied by said second manifold passage means; the improvement comprising the control device having:

A. valve means disposed intermediate said first manifold passage means and said third passage means, said valve means including a first position allowing open communication between said first passage means and said third passage means, and a second position blocking flow between said first passage means and said third passage means while communicating the first passage means with ambient atmospheric pressure;

B. first actuating means for moving and maintaining said valve means in said first position;



C. second actuating means for moving and maintaining said valve means in said second position;

D. vacuum passage means communicating said second manifold passage means with said second actuating means whereby when the vacuum in said second manifold passage means reaches a predetermined value said second actuating means will act on the valve means with a force sufficient to overcome the force of said first actuating means to move the valve means to its second position wherein the flow of metered air to said first manifold passage means is cut off.

4,080,949

COMBUSTION ENGINE AND INJECTOR FOR A COMBUSTION ENGINE

Willem Brinkman, Velp, Netherlands, assignor to Holec N.V., Hengelo, Netherlands

Filed Aug. 14, 1976, Ser. No. 604,547

Claims priority, application Netherlands, Aug. 21, 1974, 7411143

Int. Cl.[2] F02B *19/10*

U.S. Cl. 123—32 ST **15 Claims**

1. In combination with a combustion engine having at least one combustion cylinder provided with ignition means for igniting fuel/air mixture in said cylinder in timed relation to operation of the engine, and including an air intake conduit for said cylinder;

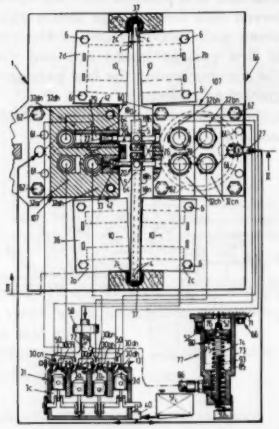
first atomizer means for discharging fuel into said cylinder in the vicinity of said ignition means;

second atomizer means for discharging fuel into said air intake conduit;

first pump means connected to said first atomizer means for delivering discrete shots of fuel to said first atomizer means at a high pressure sufficient to overcome the internal pressure of said cylinder during the last half of the engine compression cycle for said cylinder whereby a fuel rich environment is present in the vicinity of said ignition means at the time of ignition, and drive means for actuating said first pump means comprising an armature and an electromagnet for attracting said armature to pump fuel and means for energizing said electromagnet for fixed time durations independent of the rotational speed of the engine;

second fuel pump means connected to said second atomizer means for intermittently delivering discrete shots of fuel to said second atomizer means at times other than those in

which said first pump means is actuated and at a pressure lower than said high pressure and in amounts to provide lean fuel/air mixture to said cylinder; and



control means for controlling the volumes of said discrete shots of fuel delivered to said first and second atomizer means.

4,080,950

BALL THROWING DEVICE

John K. Paulson, Lake Oswego, and Walter J. Steffan, Portland, both of Oreg., assignors to Jo Paul Industries, Inc., Tualtin, Oreg.

Continuation-in-part of Ser. No. 554,920, Mar. 3, 1975, abandoned. This application Sep. 16, 1976, Ser. No. 724,022
Int. Cl.[2] F41B *15/00*
U.S. Cl. 124—1 **6 Claims**

1. A ball throwing device, comprising:

a. a support assembly including a base member, and a support member mounted on the base member for rotation and about a horizontal axis and having at least one portion thereof projection radially outward from the base member for 180° selective rotational adjustment about said horizontal axis to opposite vertical sides of said axis,

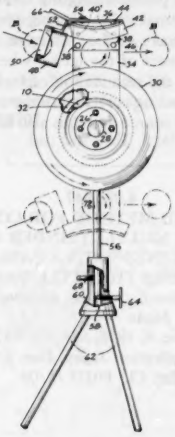
b. a rotary wheel having a ball-engaging surface, the wheel being mounted on the support assembly for rotation about an axis parallel to the said horizontal axis of rotational adjustment of the support member,

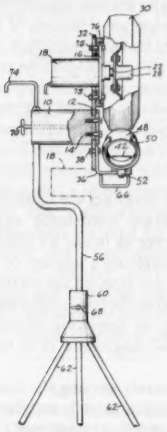
c. drive means engaging the wheel for rotating the ball-engaging surface thereof in a ball throwing direction at a speed predetermined to project a ball therefrom at a selected velocity,

d. a pad means mounted on the support member for rotation therewith about said horizontal axis, the pad means having a ball-engaging surface spaced radially from the ball-engaging surface of the wheel a distance slightly less than the diameter of a ball to be thrown for compressing a ball against the wheel, and

e. means for supporting the base member for rotation about a vertical axis whereby to accommodate throwing of a ball in the same direction when the pad means is positioned above the wheel and when the pad means is positioned below the wheel

f. said rotary wheel on pad means being mounted on said at least one radially projecting portion of the support mem-





ber for adjustment to opposite vertical sides of said horizontal axis of rotation.

4,080,951

ARCHERY BOW STRING SILENCER

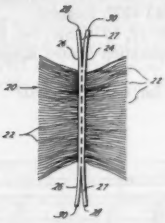
Earle W. Bateman, III, 705 Robin Cir., Pasadena, Tex. 77502

Filed Oct. 26, 1976, Ser. No. 735,579
Int. Cl.[2] F41B *5/00*
U.S. Cl. 124—92 **7 Claims**

1. An archery silencer for use on the string and/or cable of an archery bow comprising,

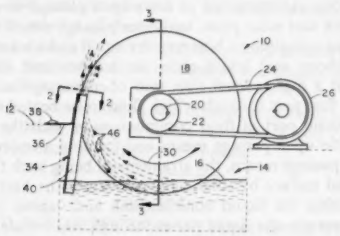
a plurality of lengths of fibrous material positioned generally parallel to each other,

a flexible support secured to one side of the lengths of fibrous material, and



said support including means at each end of said support for securely attaching said silencer on an archery bow string to reduce vibration of a bow string.

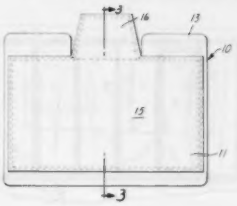
4,080,952
RIM PUMP
Harry C. Wain, Hampden Rd., Somers, Conn. 06071
Filed Nov. 26, 1976, Ser. No. 745,380
Int. Cl.[2] B28D *1/04*
U.S. Cl. 125—13 R **5 Claims**



1. For use in a lapidary saw for sawing a cut in a stone at a cutting station, an apparatus comprising a base having a coolant reservoir, a saw blade operatively mounted on the base with a bottom portion of the blade immersed in coolant contained in the reservoir, power operated means for driving the saw blade in a selected direction to effect an up-sawing operation wherein the blade is driven from the reservoir with an upward movement through the cutting station, and a shroud surrounding the saw blade in the coolant flow path in underlying adjacent relation to the cutting station for positively directing coolant, driven by movement of the saw blade from the reservoir to the shroud, into a cut of the stone disposed in the cutting station above the shroud.

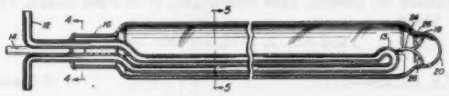
4,080,953
ELECTROCHEMICAL HEATING DEVICE
William C. Mitchell, Arden Hills, and Gregory R. Wyberg, Minneapolis, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Dec. 8, 1976, Ser. No. 748,760
Int. Cl.[2] F24J *1/04*
U.S. Cl. 126—263 **14 Claims**

1. A shelf-stable electrochemical heating device capable of generating heat at a controlled rate comprising a container adapted to be placed against an article so as to transfer heat developed within the container to the article; and disposed within the container, 100 mole-parts of a mass of subdivided pieces of a metal adapted to serve as the anode in an electrochemical cell; a water-soluble salt present in an amount sufficient to provide a solution having a conductivity of at least 0.05 mho/centimeter when dissolved in 500 mole-parts of water; and cathode means selected from the group consisting of (1) coatings of electrically conductive metal on the metal anode pieces covering between about 15 and 85 percent of the surface area of the pieces, and (2) at least 0.25 mole-part of a plating salt that provides metal ions adapted to react with said metal anode pieces in said conductive solution and form a



coating of the metal on the pieces; at least 60 percent of the heat produced after mixing of the reactants and formation of said conductive solution being produced through electrochemical reactions, including reduction of water to hydroxyl ions and hydrogen gas at the cathode and oxidation of the anode metal pieces.

4,080,954
SOLAR COLLECTOR APPARATUS
Gerrit de Wilde, A. E. Thurston, Rt. 4, Eugene, Oreg. 97405, and Gunther Weiss, 2025 S. W. Briggs Ct., Beaverton, Oreg. 97005
Filed Apr. 23, 1976, Ser. No. 679,664
Int. Cl.[2] F24J *3/02*
U.S. Cl. 126—270 **7 Claims**

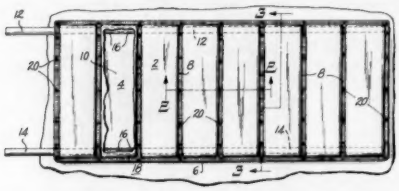


1. A glass solar energy collector tube comprising an outer cylindrical evacuated jacket having a reflective coating on its inner surface extending approximately half the circumference of the jacket and constituting a concave mirror, inner glass absorption tubing circulating heat storing fluid in and out of the jacket, said tubing lying in the focal plane of the concave reflecting surface, glass connecting means between the outer jacket and inner tubing to support and position the tubing within the jacket, and blackening means associated with the inner tubing to increase the absorption of heat energy, the jacket comprising a main elongated cylindrical body portion having a central longitudinal axis, a sealed necked entry portion coaxial with the longitudinal axis, and a diminished rounded end, and the reflecting surface extending the length of the main elongated cylindrical body portion of the jacket, the absorption tubing for circulating the heat storing fluid entering through the sealed entry of the jacket and being offset in the main body portion, extending nearly the length of the main body portion of the jacket, and doubling over upon itself, an ingress leg of the absorption tubing lying along the principal axis of the concave mirror and an egress leg of the inner tubing paralleling the ingress leg of the tubing between the ingress leg of the inner tubing and the longitudinal axis of the body portion of the jacket for capturing scattered radiation and being similarly offset to exit the sealed necked entry of the jacket.

4,080,955
PORTABLE SOLAR ENERGY COLLECTOR

Wayne R. Sandstrom, Box 2414, Fairbanks, Ak. 99707

Filed May 10, 1976, Ser. No. 684,771
Int. Cl.² F24J 3/02
U.S. Cl. 126—271 5 Claims



1. A solar energy collector consisting of:

a generally flat bag of flexible water-impervious material and having opposed walls sealed together at their peripheral edges;

inlet and outlet tubes extending through one end edge of said bag and extending along opposite edges thereof within said bag;

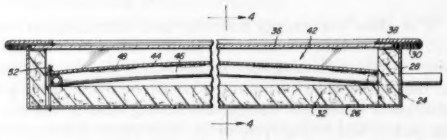
means dividing the interior of said bag into a plurality of compartments extending thereacross between said inlet and outlet tubes; and

openings in the sides of each of said inlet and outlet tubes communicating with each of said compartments.

4,080,956
SOLAR HEAT ABSORBER

Richard W. Dawley, 2164 Bonnie Dr., West Palm Beach, Fla. 33406

Filed Jun. 2, 1975, Ser. No. 582,886
Int. Cl.² F24J 3/02
U.S. Cl. 126—271 5 Claims

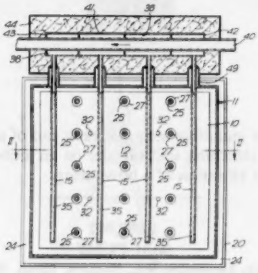


1. A solar heat absorber comprising an insulated housing having a transparent member exposed to solar heat, and an absorber plate mounted in said housing below the transparent member, said absorber plate comprising a heat conductive panel having a substantially smooth and uninterrupted surface facing the transparent member, conduit means disposed completely below the panel and adapted to be communicated with heat exchange fluid inlet and outlet means, and means securing said conduit means to the undersurface of said panel, said panel being arcuately curved with the convex surface disposed adjacent to but in spaced relation to the transparent member, the periphery of the panel being adjacent the internal insulation forming the insulated housing to provide a dome-like cavity in underlying relation to the panel for enabling the solar heat to elevate the temperature of the heat conductive panel, said conduit means being constructed of heat conductive material for efficient transfer of heat to the heat exchange fluid.

4,080,957
SOLAR PANEL

Christopher John Bennett, Little Stratton, Moor Hall Lane, Danbury, Essex CM3 4ER, England

Filed Jan. 19, 1976, Ser. No. 650,397
Claims priority, application United Kingdom, Jan. 20, 1975, 2404/75
Int. Cl.² F24J 3/02
U.S. Cl. 126—271 15 Claims



1. Apparatus for use in heating a fluid by means of solar energy, comprising a solar plate having a surface adapted to receive solar radiation, one or more open passage means associated with said solar plate, said open passage means having a liquid zone containing a heat transfer liquid and a transfer zone located above said liquid zone, an indirect heat exchanger located at a higher level than said open passage means and having a first part through which fluid to be heated can pass, and a second part in fluid communication with the transfer zone of the open passage means and forming a sealed system with the passage means, the arrangement being such that heating of said surface by solar radiation causes the heat transfer liquid within the liquid zone to boil, and vapour from the boiling heat transfer liquid passes through said transfer zone of said open passage means to the heat exchanger where it passes in heat exchange relationship with the fluid to be heated, and heat transfer liquid condensing in said second part of the heat exchanger returns to the upper part of said liquid zone under gravity through said transfer zone of said open passage means.

6. A method of heating a fluid using solar energy, in which a heat transfer liquid is contained within a sealed system which includes open passage means associated with a solar plate having a solar energy-receiving surface and one side of an indirect heat exchanger located at a higher level than said open passage means, said open passage means comprising a liquid zone containing the heat transfer liquid and a transfer zone communicating with said one side of the heat exchanger, the method comprising the steps of: raising the temperature of the heat transfer liquid in said liquid zone to its boiling point by heat transfer from said solar plate, causing the vapor from the boiling liquid to pass through said transfer zone to said one side of the heat exchanger, heating said fluid in said exchanger by indirect heat exchange relationship with the fluid to be heated, and returning liquid condensing from the vapour in said heat exchanger under gravity to the upper part of said liquid zone through said transfer zone of said open passage means.

4,080,958
APPARATUS FOR AIDING AND IMPROVING THE BLOOD FLOW IN PATIENTS

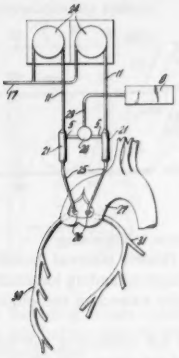
David Bregman, New York, N.Y.; Bruce L. Hanson, Wayne, N.J., and Sidney Wolvek, Brooklyn, N.Y., assignors to Datascope Corporation, Paramus, N.J.

Filed Feb. 27, 1976, Ser. No. 662,287
Int. Cl.² A61M 1/03
U.S. Cl. 128—1 D 15 Claims

13. Apparatus for providing a pulsatile flow of blood to the coronary arteries of the heart comprising:

a. pump means, having an input adapted to be coupled to receive blood from a patient, to provide, at at least two outputs, a substantially steady flow of blood;

b. at least first and second avalvular pulsatile means having their inputs respectively coupled to said at least two pump outputs to convert said steady flow to pulsatile flow at their outputs without causing additional trauma to the



blood, said outputs adapted to to be connected to the coronary arteries of the heart;

c. control means to deliver a control medium to each of said pulsatile means in order to control the nature of said pulsatile flow; and

d. valve means connected to said control means and to each of said pulsatile means to direct the flow of said control medium to each of said pulsatile means.

4,080,959

METHOD FOR DETECTION OF TUMORS OF THE BREAST

Robert F. Leveen, 122 S. 51st St., Omaha, Nebr. 68132

Filed Jun. 18, 1976, Ser. No. 697,569
Int. Cl.[2] A61B *5/00*
U.S. Cl. 128—2 H **4 Claims**

1. A method for the detection of tumor sites in vivo in human tissue which comprises:

(a) coating a portion of the skin tissue surface of the body with a thin film of a heat sensitive liquid which changes color in response to thermal energy input into the tissue

(b) heating the entire portion of the body subadjacent to the coated tissue surface uniformly to elevate the normal tissue of the portion of the body heated to a temperature of not more than 104° F and the abnormal tissue of the same portion to a temperature in excess of this temperature so as to cause a color differential in the surface coating and

(c) scanning the skin tissue so color coated to identify hot spots thereon as possible sites of underlying tumors

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4,080,960

ULTRASONIC TECHNIQUE FOR CHARACTERIZING SKIN BURNS

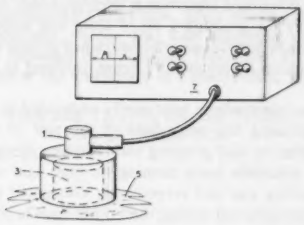
Ronald E. Goans; John H. Cantrell, Jr., both of Knoxville, Tenn.; F. Bradford Meyers, East Alton, Ill., and Harry D. Stambaugh, Louisville, Ky., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Nov. 4, 1976, Ser. No. 738,982
Int. Cl.[2] A61B *10/00*
U.S. Cl. 128—2 V **10 Claims**

1. The method of determining the depth of a skin burn in animal tissue, said method comprising:

acoustically coupling an electric-to-acoustic transducer to the surface of said burn through an intervening layer of a coupling medium whose acoustical impedance approximates that of said tissue,

electrically exciting the transducer to (a) transmit ultrasonic pulses having a peak frequency in the range of about 0.5 to 40 megahertz inwardly through said burn and (b) gener-



ate, from resulting reflected ultrasonic pulses, electrical signals separated by a time interval proportional to the distance between the coupling-medium-to-burn surface interface and the burn-to-unburned tissue interface, and

determining the depth of said burn from said signals.

4,080,961

FETUS SCALP ELECTRODE INSTRUMENT

Crosby J. Eaton, 1433 Stagecoach SE., Albuquerque, N. Mex. 87123

Filed Dec. 22, 1976, Ser. No. 753,280
Int. Cl.[2] A61B *5/04*
U.S. Cl. 128—2.06 E **11 Claims**

1. A fetus scalp electrode instrument comprising:

a flexible outer tube of sufficient length to reach a fetus scalp from outside the mother's body through her passages and having a first end serving as the insertion end thereof and a second end serving as the control end thereof;

a flexible electrode drive tube telescoping within said outer tube, longer than said outer tube and having a first end serving as the insertion end thereof and a second end serving as the control end thereof, said second end of said electrode drive tube protruding from said second end of said outer tube;

a collar on said second end of said drive tube for facilitating manipulation of said electrode drive tube within said outer tube;

an electrode-carrier plug adjacent to said first end of said electrode drive tube and normally located within said outer tube and having a rear face facing the interior of the length of said drive tube and a front face facing in the opposite direction;

a grasping electrode having a root portion embedded in said electrode-carrier plug, said grasping electrode being made of spring metal wire, protruding from said front face of said plug and having opposed arms diverging, from said root portion embedded in said plug, to a maximum width

which, when said electrode is not constrained by said outer tube, substantially exceeds the outer diameter of said outer tube, said opposed arms being crossed on the side of their place of maximum divergence away from said plug and being hooked over beyond the crossing so that the ends of the arms are in a pincer configuration which is closed, when said electrode is unconstrained, to a degree necessary for grasping a bit of scalp and which is open when the opposed arms are constrained at their said places of maximum divergence by being confined in said outer tube;

a reference electrode at least partly embedded in said plug, for increasing the stray field of the pair of electrodes constituted by said grasping and reference electrodes, and

a pair of electrode leads running through said drive tube, each having one end respectively connected to each of said electrodes and having their other ends brought out of said drive tube as well as out of said outer tube,

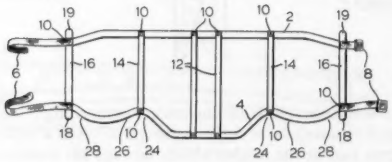
whereby the instrument may be inserted to approach closely the scalp of a fetus with the grasping electrode open at or near the end of the outer tube and the outer tube may then be retracted while keeping the electrode drive tube stationary or slightly advancing until the grasping electrode, which was previously confined in open position by the outer tube, is advanced relative to the outer tube to a point at which it is no longer confined and closes to grasp a portion of fetus scalp.

4,080,962

POSTURE-TRAINING BRACE

Joseph Berkeley, 1273 Ouellette Ave., Windsor, Ontario, Canada (N8X 1V3)

Filed Jul. 24, 1975, Ser. No. 598,673
Int. Cl.[2] A61F *5/02*
U.S. Cl. 128—78 **9 Claims**



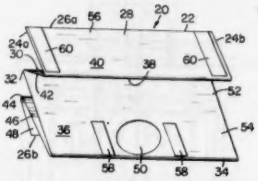
1. A posture training back brace comprising a semi rigid thoracic band adapted to surround the back and sides of the rib cage of a patient with the front ends of the band curved around to cross the front edges of the rib cage, a semi rigid pelvic band adapted to surround the back and sides of the pelvis of a patient with the rear portion of the band adapted to be seated on the lower end of the sacrum, the side portions of the band being arched upwardly from the rear portion to clear the hip joints of the patient, with the front ends of the band curved around to pass beneath the front protuberance or spine of the hip or iliac bones, tensioning straps connecting the front ends of each of the bands and a plurality of resiliently flexible struts each extending between the pelvic band and the thoracic band, these struts including inwardly arched struts adapted to be located dorsally to either side of the spine, further inwardly arched struts adapted to be located laterally above each hip joint, and additional struts adapted to be located ventrally to either side of the abdomen.

4,080,963

FENESTRATED DRAPE

Jack D. Merry, Sleepy Hollow, and Mark W. Kolstedt, Cary, both of Ill., assignors to The Kendall Company, Boston, Mass.

Filed Nov. 15, 1976, Ser. No. 742,155
Int. Cl.[2] A61F *13/00*
U.S. Cl. 128—132 D **10 Claims**



1. A folded drape, comprising:

a sterile sheet of flexible material including,

a pair of side edges extending longitudinally along the sheet,

a pair of laterally extending end edges connecting said side edges,

a first surface for contacting the body of a patient after placement of the drape,

a second surface facing away from the patient after placement of the drape,

first and second spaced lateral fold lines extending between said side edges and defining a laterally extending central panel having a fenestration located adjacent a lateral central portion thereof,

a third lateral fold line extending between said side edges and located intermediate the central panel and one of said end edges, said third fold line defining a laterally extending end panel intermediate said one end edge and said third fold line, said first fold line being located intermediate said second and third fold lines,

at least one laterally extending connecting panel intermediate said first and third fold lines, said connecting panel being folded into a configuration overlying the first surface of a first end portion of the central panel, said first end portion being covered between the first and third fold lines, said third fold line being spaced from the second fold line and the first surface of a second end portion of the central panel being exposed intermediate said second and third fold lines, said fenestration being located in said second end portion, and said first surface of the end panel being exposed in the folded configuration, and at least one end section extending from the second fold line and folded beneath the central panel;

a pair of first adhesive zones located on opposed sides of and adjacent the fenestration in said second end portion of the central panel, said first adhesive zones facing outwardly from said first surface;

a pair of first release sheets covering and releasably attached to said first adhesive zones;

a pair of second adhesive zones on said end panel adjacent opposed side edges of the sheet, said second adhesive zone facing outwardly from said first surface; and

a pair of second release sheets covering and releasably attached to said second adhesive zones.

4,080,964

DIVING GAS RECOVERY APPARATUS

Hilbert Joseph Savoie, Jr., P.O. Box 98, Boutte, La. 70039

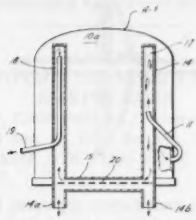
Filed Jun. 28, 1976, Ser. No. 700,320
Int. Cl.[2] A62B *7/00*
U.S. Cl. 128—142.3 **18 Claims**

1. A diving habitat for use underwater and being adapted for connection to a source of breathable gas and for connection to a diving gas reconditioning system for receiving expired

breathing gas from the habitat and reconditioning said expired breathing gas for reuse, comprising:

a diving habitat body adapted for mounting with the diver and including means for receiving a breathable gas and a recovery line extending to the diving gas reconditioning system;

coupling means communicating the interior of said habitat body with said recovery line adapted for connection to such diving gas reconditioning system;



said coupling means including means transferring expired breathing gas from said habitat body to said recovery line under normal conditions; and

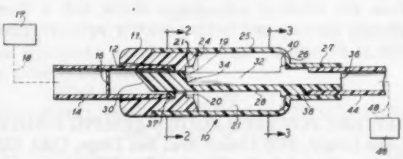
said coupling means further including substitution means for transferring surrounding water into said recovery line in response to a dangerous change in pressure therein thereby regulating the transfer of expired breathing gas from said habitat body and preventing such deleterious change in pressure from acting on said diving habitat body.

4,080,965

IN-LINE CANNULA VALVE ASSEMBLY

Thomas E. Phillips, Ingleside, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Sep. 30, 1976, Ser. No. 728,479
Int. Cl.² A61M 5/14
U.S. Cl. 128—214 D **10 Claims**



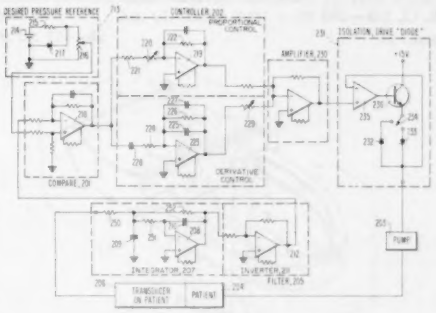
1. An in-line cannula valve assembly for controlling flow through a conduit, comprising: a housing, including a collapsible housing part comprising a flexible wall, joined to a relatively rigid housing part; a first fluid passage in said collapsible housing part, and a second fluid passage in said relatively rigid housing part; a cannula element, defining a piercing point at a first end of the cannula element, the piercing point end being positioned in said second fluid passage, and the opposite end of the cannula being positioned adjacent said first fluid passage, said cannula element being adapted for longitudinal movement through said first and second fluid passages; a longitudinal groove defined in the cannula element extending to said opposite end thereof and terminating short of said piercing point to define a sealing surface between said piercing point and groove; sealing means positioned about said cannula element, whereby longitudinal movement of said cannula element permits the positioning of said cannula element in a first, closed position, in which said longitudinal groove is spaced from said sealing means and the sealing means engages the sealing surface, and a second, flow-permitting, longitudinal position in which said groove passes through said sealing means to permit fluid flow along said groove between said first and second fluid passages; and a rupturable membrane preventing flow through said conduit, and positioned to be ruptured by the piercing point of said cannula element by longitudinal movement thereof.

4,080,966

AUTOMATED INFUSION APPARATUS FOR BLOOD PRESSURE CONTROL AND METHOD

Robert T. McNally, Secane, Pa.; Karl Engelman, Cherry Hill, N.J., and Abraham Noordergraaf, Haverford, Pa., assignors to Trustees of the University of Pennsylvania, Philadelphia, Pa.

Filed Aug. 12, 1976, Ser. No. 713,645
Int. Cl.² A61M 5/14
U.S. Cl. 128—214 E **10 Claims**



1. Apparatus for infusing drugs into a patient to achieve a desired blood pressure level comprising:

means for developing a representation of said desired level;

transducer means for evaluating the present blood pressure of the subject, and for developing a signal in correspondence therewith;

control means, responsive to the difference between said representation of said desired pressure and the signal in correspondence with said present pressure, and to the derivative of said difference, for developing an infusion control signal; and

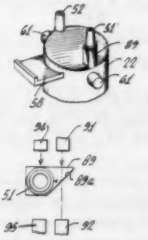
pump means, responsive to said infusion control signal, for injecting said drugs into the patient.

4,080,967

PARENTERAL SYRINGE PUMP DRIVE SYSTEM WITH INSTALLATION INDICATOR MEANS

Stephen H. O'Leary, San Diego, Calif., assignor to IVAC Corporation, San Diego, Calif.

Division of Ser. No. 554,230, Feb. 28, 1975, Pat. No. 3,993,061.
This application Aug. 25, 1976, Ser. No. 717,768
Int. Cl.² A61M 5/18
U.S. Cl. 128—214 F **5 Claims**



1. For use in a syringe pump, the combination comprising:

a syringe means having a pair of inlet and outlet nipples projecting from one end of said syringe;

a fixed reference light source on one side of one of said nipples; and

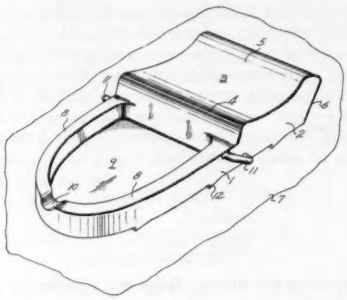
a fixed photosensor on the opposite side of said one of said nipples, said photosensor adapted to receive the light from said reference light source only whenever said nipple is not interposed between said light source and said photosensor.

4,080,968

OBSTETRICAL SUPPORT AND PAN ARTICLE

Irene L. Nielsen, 2363 McMillan St., Eugene, Oreg. 97405

Filed Oct. 6, 1976, Ser. No. 730,190
Int. Cl.[2] A61B *17/42*
U.S. Cl. 128—292 **3 Claims**



1. An obstetrical article for use during childbirth and supporting a woman's buttocks in upwardly space relationship to a bed or like surface, said article comprising,

a support having a concave surface on which the woman's buttocks are rested to upwardly space same above the bed surface,

a pan-like structure merging at one end with said support and defined by an upstanding perimetrical wall in a horizontal plane below said concave surface and a bottom wall with the bottom wall defining the lower limit of a work area, said upstanding wall defining a downwardly extending recessed area formed therein and within which the baby's neck and head may be supported during aspiration efforts, and

said support having a raised portion which confines the buttocks, said supporting surface additionally including an upwardly curved rear wall for support of the woman's lower back.

4,080,969

SUTURE OR LIGATURE CARRYING ON THE EXPOSED SURFACE THEREOF A COATING OF A POLYESTER RESIN

Donald J. Casey, Ridgefield, and George C. Gleckler, Stamford, both of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 418,138, Nov. 21, 1973, abandoned. This application May 29, 1975, Ser. No. 582,001
Int. Cl.[2] A61L *17/00*
U.S. Cl. 128—335.5 **2 Claims**

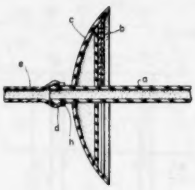
1. A sterile surgical suture or ligature composite comprising suture or ligature carrying on the exposed surface thereof a coating of a solid biodegradable, hydrolyzable polyester resin, of diglycolic acid and an unhindered glycol, having a molecular weight sufficiently high so as to provide a polymeric material possessing self-supporting film-forming properties.

4,080,970

POST-OPERATIVE COMBINATION DRESSING AND INTERNAL DRAIN TUBE WITH EXTERNAL SHIELD AND TUBE CONNECTOR

Thomas J. Miller, 800 Lombard Ave., Evansville, Ind. 47715

Filed Nov. 17, 1976, Ser. No. 742,612
Int. Cl.[2] A61M *27/00*
U.S. Cl. 128—350 R **6 Claims**



1. Post-operative combination apparatus for protecting a body surgical opening while draining fluid from the body and maintaining changeable dressing material in place over the opening comprising,

a shield of spherical segmented configuration having a spherical surface on one side;

an internal drain tube for insertion into the body via the surgical opening at one end which penetrates the shield adjacent the other end;

external tube connector means carried on said other end of the internal tube beyond the spherical side of the shield; and,

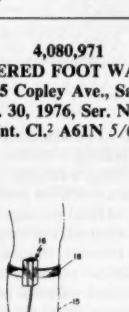
dressing material of a configuration to conform to the shield substantially opposite said one side and further including a central opening to accommodate the internal tube and a split from the central opening to the outer edge of the material to permit seating the material on the internal tube adjacent the opposite side thereof shield for sealing the opening when the shield is taped tightly to the body with the dressing material interposed between the body and the bottom part thereof wherein said external tube connector means comprises, a peripheral bulbous portion spaced from the spherical side of said shield; and, a threaded portion between said bulbous portion and said spherical side of the shield.

4,080,971

BATTERY POWERED FOOT WARMING INSOLE

Rory Ann Leeper, 2735 Copley Ave., San Diego, Calif. 92116

Filed Jul. 30, 1976, Ser. No. 710,192
Int. Cl.[2] A61N *5/00*
U.S. Cl. 128—383 **7 Claims**



1. A battery powered foot warmer for use in conventional shoes and boots to provide controlled, diffused heating to selected areas of the foot, comprising:

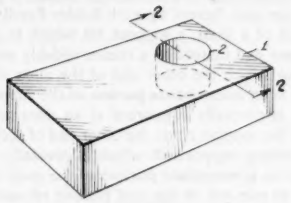
an elongated strip of resistance heating element,
an insole pad,
said insole pad being comprised of at least two layers of plastic foam insulative material,
said resistance heating element being secured between layers of said plastic foam insulative material to said pad in the toe area thereof,
a battery pack for housing a battery and for making electrical connections to said battery,
interconnecting wires for completing an electrical circuit from said battery pack to said resistance heating element.

4,080,972

PIPE WITH STORAGE CHAMBER AND METHOD OF MAKING SAME

Robert C. Furlow, 12405 Falls Rd., Potomac, Md. 20854

Filed Aug. 12, 1976, Ser. No. 713,831
Int. Cl.² A24F *1/26, 15/00, 23/04;* B23B *1/00*
U.S. Cl. 131—180 **8 Claims**



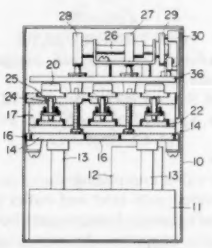
1. A smoking pipe comprising a unitary, integral wood construction having a bowl, a smoking passage means connected to said bowl, an internal storage chamber, passage means extending to the exterior wall of said pipe and connecting said chamber to said bowl, and means in said passage means to permit the feeding of tobacco which may be stored in said chamber to said bowl and to modulate the air mixture to said bowl.

4,080,973

APPARATUS FOR PAYING OUT COINS OF CHANGE

Osamu Kobayashi, Sakadomachi, Japan, assignor to K.K. Nippon Coinco, Tokyo, Japan

Filed Mar. 18, 1977, Ser. No. 778,990
Claims priority, application Japan, Mar. 25, 1976, 51-36008
Int. Cl.² G07D *1/02*
U.S. Cl. 133—5 R **5 Claims**



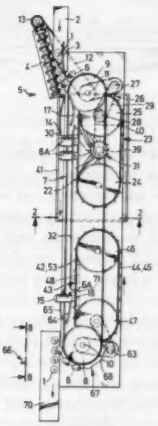
1. Apparatus for paying out change coins one by one comprising a frame, a motor, a disc driven by said motor, a movable member reciprocated by said motor, a plurality of operating plates slidably disposed within said movable member, pins located within said movable member and projected therefrom in response to the movement of the corresponding one of said operating plates, a plurality of coin pay-out plates each located to freely engage with the corresponding one of said pins, a plurality of coin holding cylinders for feeding coins therefrom one by one on the corresponding one of said coin pay-out plates, and a controlling mechanism operatively connected to said movable member, whereby when said movable member is moved, said operating plates are also moved selectively one by one through said controlling mechanism, and said pay-out plates are reciprocated by the movement of the respective operating plates thereby paying out the change coins one by one.

4,080,974

BOTTLE CLEANING APPARATUS

Edward James Oag, 27 Young St., Wahroonga, New South Wales, Australia

Filed Oct. 22, 1976, Ser. No. 734,827
Claims priority, application Australia, Oct. 22, 1975, PC3671
Int. Cl.² B08B *3/02, 9/08*
U.S. Cl. 134—62 **12 Claims**



1. A bottle cleansing apparatus comprising:
a plurality of bottle cradles;
a first conveyor for moving said cradles along a path, said cradles being hingedly mounted to said first conveyor in spaced relation for part rotation of each said cradle about an axis longitudinal of said first conveyor path;
means along the path of said first conveyor for presenting generally upstanding bottles laterally to said cradles while said cradles are generally upright at a loading station;
each said cradle having a floor portion upon which a laterally presented generally upstanding bottle can rest while said cradle is generally upright;
means along the path of said first conveyor downstream of said loading station for hingedly part rotating said cradles about said lontitudinal axis to invert said cradles and the bottles carried therein;
each said cradle having a roof portion with an aperture therein, said roof portion being peaked so that, when said cradle and the bottle carried therein are inverted by partrotation, the mouth of the bottle is directed downwardly into register with said aperture and the bottle is supported in generally inverted deposition on said roof portion;
a plurality of nozzles for injecting a fluid through said apertures and into the downwardly directed bottle mouths after said cradles are inverted;
a second conveyor on which each said nozzle is supported for movement in register with a respective downwardly directed bottle mouth over a predetermined length of the path of said first conveyor;
means downstream of said predetermined length of the path of said first conveyor for reverting said cradles so that the bottles re-assume a generally upstanding position; and

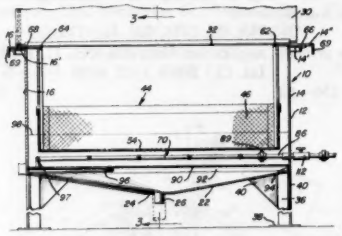
means for removing the bottles from their respective cradles at an unloading station after reversion of said cradles.

4,080,975

HEATED AND AIR INJECTED TANK FOR PARTS CLEANER

Samuel R. H. Williams, Jr., P.O. Box 171, Wilson, N.C. 27893

Filed Dec. 9, 1976, Ser. No. 748,817
Int. Cl.[2] B08B 3/10
U.S. Cl. 134—94 **4 Claims**



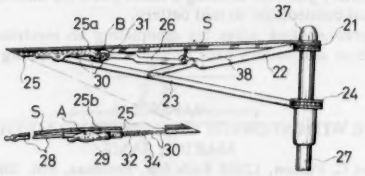
1. In combination, an upwardly opening horizontally elongated rectangular tank including peripherally extending upstanding opposite side and opposite end walls interconnected at their lower marginal portions by means of a bottom wall extending and secured therebetween, said tank being adapted to have a cleaning liquid disposed therein to a predetermined level, heater means in a lower portion below said level operative to heat said liquid, a foraminous horizontal baffle disposed in said tank below said level and above said bottom wall, a multibranched tubular air manifold disposed horizontally in said tank above said baffle and below said level, said manifold including means defining jet-type air outlet openings therefor spaced along the multiple branches of said manifold and operative to discharge jets of air upwardly into the liquid disposed in said tank in response to the interior of said manifold being communicated with a source of air under pressure, and an upwardly opening receptacle including foraminated bottom wall portions, said receptacle and tank including coacting means operative to support said receptacle within said tank with the foraminated bottom wall portions disposed below said level and above said manifold, said manifold being horizontally elongated and including tubular peripherally extending opposite side and opposite end marginal portions and a plurality of laterally spaced generally parallel transverse tubular cross portions extending between and communicating with said tubular opposite side marginal portions intermediate said opposite end marginal portions, said jet-type air outlet openings being spaced along said marginal and cross portions, said air outlet openings spaced along said marginal portions opening upwardly along paths inclined toward the center of the area bounded by said marginlal portions, alternate air outlet openings spaced along said cross portions opening upwardly along paths inclined to opposite sides of said cross portions, said peripherally extending marginal portions of said manifold generally paralleling the adjacent side walls of said tank and being spaced inwardly therefrom sufficiently to enable return downward flow of the liquid in said tank along the inner surfaces of the side walls thereof outwardly of the corresponding marginal portions of said manifold, said heater means being disposed in said tank below said baffle, said bottom wall including a sump portion thereof downwardly toward which surrounding portions of said bottom wall are inclined, said sump portion including selectively useable downwardly opening drain means, and said sump portion being centrally disposed relative to the plan area of said bottom wall.

4,080,976

THREE-STAGE COLLAPSIBLE UMBRELLA

Masaaki Hirai, Osaka, Japan, assignor to Asahi Kogyo Co., Ltd., Osaka, Japan

Filed May 16, 1977, Ser. No. 797,516
Int. Cl.[2] A45B 19/10
U.S. Cl. 135—25 R **4 Claims**



1. A three-stage collapsible umbrella having rib assemblies each of which comprises a main rib which is pivotally supported at one end thereof by a rib holder fixedly mounted on the top end of a shaft, a support rib which is pivotally supported at one end thereof by a runner slidably mounted on the shaft and to which the other end of the main rib is pivotally connected at an intermediate portion of the support rib, a roof rib which is pivotally supported at an intermediate portion thereof by the support rib at the other end of such support rib, and an auxiliary support rib which is pivotally connected at one end to an intermediate portion of the main rib and at the other end to one end of the roof rib, the rib assemblies being fashioned such that such assemblies are stretched and folded automatically when the runner is moved upwardly and downwardly on and along the shaft, the umbrella further having tip ribs each of which is pivotally connected at one end thereof to the other end of each of the roof ribs, and elongated sliding means arranged at alongside the roof ribs each of which means is operatively connected at base end to each of said rib assemblies and at the opposite end to each of said tip ribs through bent connecting means in a fashion such that the tip rib is stretched automatically by the pulling action of the sliding means when the rib assembly is stretched, characterized in that each of said elongated sliding means is supported so that the means is independently movable by a small distance along the lengthwise direction thereof, and that spring means are provided at between said roof ribs and elongated sliding means each of which spring means forces each of said elongated sliding means to slide toward the direction of folding the tip rib associated therewith during the closing operation of umbrella until the tip rib has been folded.

4,080,977

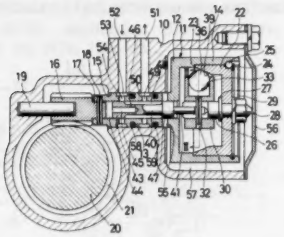
GOVERNOR VALVE

Tsunehiko Ogasawara, Kariya, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Japan

Filed Sep. 13, 1976, Ser. No. 722,763
Claims priority, application Japan, Sep. 29, 1975, 50-117400
Int. Cl.[2] G05D 13/14
U.S. Cl. 137—56 **4 Claims**

1. A governor valve comprising:
a housing provided with inlet and outlet ports;
a rotational shaft provided within said housing;
a body rotatably supported by said housing for rotation about a given axis therein and operatively connected to said rotational shaft;
a valve spool slidably disposed along said given axis within said body for controlling the communication between said inlet and outlet ports;
a ball cage slidably disposed along said given axis within said body and being provided with a plurality of cylindrical portions radially and outwardly extended therefrom;
a plurality of ball members slidably inserted into said plurality of cylindrical portions of said ball cage; and

a cam member non-movable axially relative to said body and being provided with a tapered face for receiving a centrifugal force of said plurality of ball members;



said governor valve being characterized by said valve spool being moved against the output fluid pressure by an axial component generated by contacting said plurality of ball members with said tapered face of cam member.

4,080,978

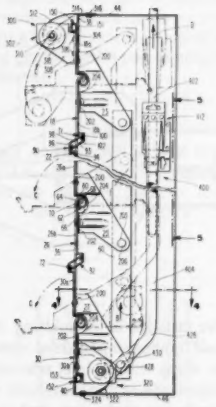
SMOKE, FIRE AND AIR CONTROL DAMPER

Francis J. McCabe, 239 Hastings Ct., Doylestown, Pa. 18901

Continuation-in-part of Ser. No. 689,994, May 26, 1974. This application Feb. 24, 1977, Ser. No. 771,473

Int. Cl.[2] E05F *15/20;* **F24F** *13/14;* **F16K** *1/22*

U.S. Cl. 137—79 **14 Claims**



1. A fire damper comprising:

(a) a frame;

(b) a plurality of blades associated with said frame;

(c) rotation means for allowing selective rotational displacement of said blades between closed and open positions with respect to said frame;

(d) linkage means for articulating the position of said plurality of blades with respect to each other and with respect to the frame during the rotation thereof; and

(e) at least two biasing means for simulataneously forcing said blades from said open toward said closed position, said biasing means being located on opposite sides of said blades in said closed position.

4,080,979

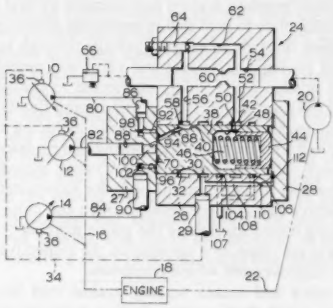
COMBINED SUMMING AND UNDERSPEED VALVE

Allyn J. Hein, Camdenton, Mo., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Mar. 22, 1977, Ser. No. 779,979

Int. Cl.[2] F04B *49/08*

U.S. Cl. 137—118 **9 Claims**



1. A combined summing and underspeed valve comprising:

a valve body having a bore;

a spool within said bore;

an outlet from said bore in said body intermediate the ends of said bore;

a pair of spaced inlets in said bore for receiving fluid under pressure to apply force to opposite ends of said spool;

at least two additional inlets in said body for receiving fluid under pressure to apply force to one of said ends of said spool; and

means for isolating fluid from the inlet of said pair applying force to said spool one end from fluid from said additional inlets.

4,080,980

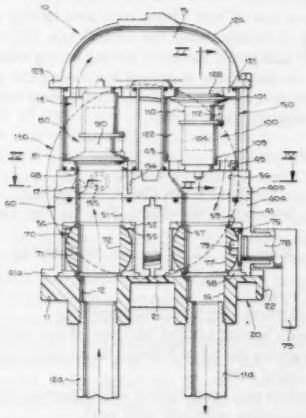
BACKFLOW PREVENTING VALVE CONSTRUCTION

Edwin J. Hunter, Rancho Santa Fe, Calif., assignor to The Toro Company, San Marcos, Calif.

Filed Jun. 11, 1976, Ser. No. 695,176

Int. Cl.[2] F16K *24/00*

U.S. Cl. 137—218 **18 Claims**



16. In a backflow preventing valve having a body with an inlet passage for connection to a source of fluid, an intermediate chamber fluidly connected to the inlet passage via an inlet

check valve, an outlet passage fluidly connected to the intermediate chamber via an outlet check valve for connection to a receiver of fluid, a diaphragm chamber fluidly connected to the inlet passage and to the intermediate chamber and having a diaphragm therein dividing the diaphragm chamber into an inlet pressure portion and an intermediate pressure portion, a backing plate in said diaphragm chamber supporting said diaphragm and a relief valve in fluid communication with said intermediate pressure portion and operable by said diaphragm and backing plate to vent said intermediate pressure portion to atmosphere through an exhaust passage through said backing plate and having a valve seat and valve seal means, said inlet pressure portion being fluidly connected to the inlet passage and said intermediate pressure portion being fluidly connected to the intermediate chamber, said body including a valve seat member and a piston receiving opening therein associated with each check valve, each of said check valves including a valve piston member mounted on the body for movement relative to its respective seat member between open and closed positions, and biasing means for biasing the piston member to the closed position in the respective opening on the respective seat member, the improvement which comprises:

said valve seal means bearing against said backing plate closing off fluid communication between said exhaust passage and said intermediate pressure portion allowing slight movement of said diaphragm whereby, upon variations in the fluid pressure said diaphragm flexes a limited amount, but upon a leak of fluid from said outlet passage into said intermediate chamber, said diaphragm flexes beyond said limited amount with said backing plate moving away from abutment with said relief valve causing a space to open between said backing plate and relief valve thereby opening fluid communication between said intermediate chamber and said exhaust passage exhausting excess fluid from said intermediate chamber through said exhaust passage to the atmosphere to avoid contaminating the fluid supply said at least one of said check valves includes an outer piston member and a telescoping inner piston member and booster means associated with said biasing means for forcibly closing said at least one of said check valves in combination with said biasing means but presenting a relatively negligible resistance to opening of said at least one of said check valves by said biasing means after said at least one of said check valves reaches an initial open position, and said biasing means includes a spring associated with said piston members for biasing one of said piston members to a position closing off the respective opening in said valve seat member, said booster means including one of said piston members having a shaft extending generally along the central axis thereof and the other of said piston members having spring means thereon acting on said piston members for biasing the same in the same direction as said spring, said spring means operatively engaging said shaft.

4,080,981

ANTISIPHON CHECK VALVE

Anthony F. Stewart, 12091 Nieta Dr., Garden Grove, Calif. 92640

Filed Oct. 12, 1976, Ser. No. 731,512
Int. Cl.[2] F16K *15/14*
U.S. Cl. 137—218 **12 Claims**

1. An antisiphon check valve comprising:

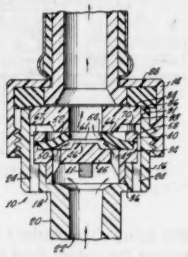
a valve body having a liquid inlet port at one end thereof and means within the body defining an air port at said one end of the valve body,

a valve seat in said body having a flow passage therethrough communicating with said inlet port,

a retainer plug in said body cooperating with said valve seat to define a valve chamber therebetween communicating with said flow passage, said plug having a liquid outlet port communicating with said chamber,

relief conduit means for providing communication between said chamber and said air port, and

a valve member mounted in said chamber upon said valve seat for motion between a closed position in which the valve seat flow passage is blocked by said valve member



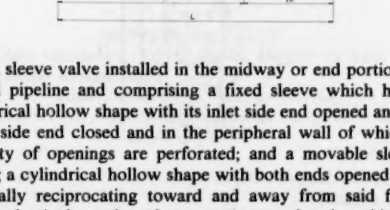
and said chamber is in communication with both said outlet port and said air port, and a full flow position in which said relief conduit means is blocked by said valve member and said chamber communicates with both said flow passage and said outlet port.

4,080,982

SLEEVE VALVE

Keiji Maezawa, Tokyo, Japan, assignor to Maezawa Industrial Incorporated, Tokyo, Japan

Filed Aug. 17, 1976, Ser. No. 715,347
Claims priority, application Japan, Sep. 2, 1975, 50-106169; Sep. 2, 1975, 50-120803[U]
Int. Cl.[2] F16K *13/00*
U.S. Cl. 137—219 **21 Claims**



1. A sleeve valve installed in the midway or end portion of a fluid pipeline and comprising a fixed sleeve which has a cylindrical hollow shape with its inlet side end opened and its outlet side end closed and in the peripheral wall of which a plurality of openings are perforated; and a movable sleeve having a cylindrical hollow shape with both ends opened and optionally reciprocating toward and away from said fixed sleeve selectively to close the respective openings bored in the peripheral wall of the fixed sleeve, the improvement wherein an inner sleeve which has a cylindrical hollow shape with its inlet side end opened and in the peripheral wall of which a plurality of openings similar to those bored in the peripheral wall portion of said fixed sleeve facing said inner sleeve are perforated is arranged within said fixed sleeve coaxially therewith, one or more ring shaped partition plates being disposed at a substantially equal interval between the outer wall of said inner sleeve and that inner wall portion of said fixed sleeve which confronts said inner sleeve.

4,080,983

VALVE BASE FOR CONNECTING HYDRAULIC VALVES IN HYDRAULIC CIRCUITS

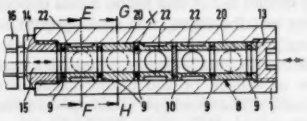
Fritz Stumpmeier, Mozartstrasse 7, 7910 Neu-Ulm, Germany

Filed May 11, 1976, Ser. No. 685,357

Claims priority, application Germany, May 15, 1975, 2521680; Feb. 10, 1976, 2605155

Int. Cl.[2] F17D *1/00*

U.S. Cl. 137—271 18 Claims



1. A valve base for connecting hydraulic valves in hydraulic circuits, comprising a body (affording) having a number of longitudinal channels extending end to end through it, said channels having coplanar axes (with their axes coplanar,) for the supply and return of a hydraulic fluid and for other hydraulic connections from the valves, groups of holes in said body and each in a (standardised) predetermined pattern to fit a (standardised) predetermined pattern of connections of a hydraulic valve, said groups of holes communicating with respective channels a transverse bore associated with each group of holes and intersecting all the longitudinal channels, (and in each transverse bore,) a column of distributor elements in each transverse bore and (modules which are) held in the bore by terminal members at the ends of the transverse bore, one distributor (module) element being located at each intersection of the transverse bore with each longitudinal channel, said distributor elements interconnecting predetermined channels for forming a predetermined hydraulic circuit, a solid spacing disc forming a partition blocking said transverse bore, at least one of said terminal members having in it an opening in alignment with axial bores of said distributor element and adapted for connection of a pipe thereto, each transverse bore being located at an intermediate position in the portion of the length of the body containing the respective group of holes, said spacing disc being located between each pair of neighboring distributor elements in a column.

4,080,984

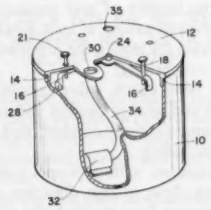
SUMP AND SUMP PUMP COVER

Robert Klein, 1112 S. Oak Circle Dr., Ingleside, Ill. 60041

Filed Jul. 19, 1976, Ser. No. 706,164

Int. Cl.[2] F16K *27/12*

U.S. Cl. 137—371 3 Claims



1. A sump cover assembly especially adapted to be used in conjunction with a sump and sump pump, comprising a walled hollow housing, said housing having internal wall surfaces having a predetermined internal diameter, said housing being open at both ends and adapted to sit in said sump over said pump, a cover portion having a peripherally disposed downwardly depending flange, said flange having an outside diameter less than that of said internal diameter of said housing, said cover portion being adapted to engage and cover, substantially sealing the uppermost open end of said housing, said cover portion defining a plurality of apertures, locking means disposed on said cover and adapted to engage adjustably frictionally said interior surfaces of said housing, said locking means being a multi-pronged assembly, each prong of said multiprong assembly frictionally engaging a portion of said internal wall surfaces having a smooth surface, said pronged assembly being a multi-armed spring spider, said spider being disposed residing substantially parallel to said cover portion, said pronged assembly including resilient arm portions, said arm portions including rubber shoes on the free ends thereof, said locking means communicating with said cover by adjustable fastening means engaging some of said plurality of apertures, said fastening means being threaded bolts and threaded nuts, said threaded bolts passing through said some of said plurality of apertures, said threaded bolts passing through openings in said arms, said threaded nuts being disposed adjacent to the free ends of threaded bolts, wherein rotating said threaded bolts causes said arms to extend radially outwardly and upwardly from the central axis of said spider so as to have said rubber shoes engage said smooth portions of said internal surface of said housing, and one of said plurality of apertures adapted to receive a sump pump discharge line therethrough.

4,080,985

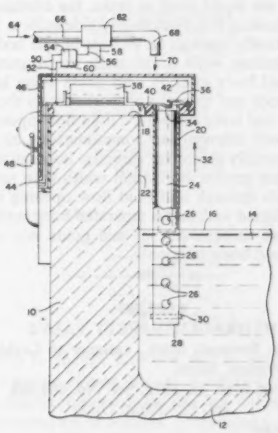
WATER LEVEL ALARM APPARATUS

John Eagle, 147-16 10th Ave., Whitestone, N.Y. 11357

Filed Jun. 17, 1976, Ser. No. 696,871

Int. Cl. F16k *31/18*

U.S. Cl. 137—429 4 Claims



1. A water level alarm and control apparatus comprising a float, a pair of stationary normally open contacts, said float urging said pair of normally open contacts into a closed circuited condition upon said float being buoyantly elevated by a fluid within a container, means to audibly signal said closed circuited condition, a power supply, said power supply providing energizing power for said audible signalling means, means to control the ingress of said fluid into said container, said control means terminating said ingress of said fluid into said container upon said closed circuited condition, means to disengageably connect said control means to a series circuit including said power supply and said pair of normally open contacts, said float comprises a multi-cellular plastic material possessing buoyant characteristics, a hollow tube, said tube having a passageway the longitudinal axis of said passageway being disposed along a vertical line, the upper end of said passageway being disposed beneath said pair of normally open contacts, said float having a cylindrical shape and being slideably disposed within said passageway, a plurality of holes within the walls of said hollow tube communicating with said passageway, a rod, said rod being removably affixed to said

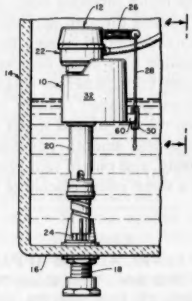
walls adjacent the other end of said hollow tube and traversing said passageway therein.

4,080,986

BALL COCK FLOAT HAVING IMPROVED ANTI-NOISE STRUCTURE

Adolf Schoepe, 1620 N. Raymond Ave., Fullerton, Calif. 92631

Filed Jul. 19, 1976, Ser. No. 706,460
Int. Cl. F16k *31/24*
U.S. Cl. 137—432 **14 Claims**



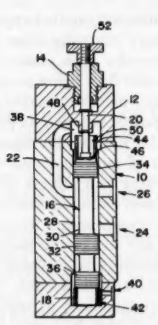
1. In a float of the type for use with ball cocks and the like in controlling the liquid level in tanks, the combination of: a hollow body having top, bottom and sidewalls; a float guide extending vertically through an interior of said body between said top and bottom walls horizontally interrupting and surrounded by said body interior, said guide being horizontally offset in said body and spaced a proportionately short distance from a part of said body sidewall; a fluid flow opening formed through said body sidewall part communicating into said body interior horizontally centered directly horizontally of said guide and of not greater horizontal width than said guide so that a flow path through said fluid flow opening is generally horizontally aligned with and is separated horizontally approximately one half to each side of said guide into and from a remainder of said body interior.

4,080,987

HYDRAULIC SAFETY VALVE

Daniel A. Fogg, Fremont, Mich., assignor to Gerber Products Company, Fremont, Mich.

Filed Mar. 22, 1976, Ser. No. 668,889
Int. Cl.² F16K *17/00*
U.S. Cl. 137—464 **2 Claims**



1. A hydraulic safety valve comprising:

a body defining a straight hollow cylindrical chamber having an inlet port and an outlet port in the side wall thereof;

piston means having a spool gate conforming to and slidably sealing the inner side wall of said cylindrical chamber and translatable in response to piston movement for selectively blocking and unblocking said inlet port;

said piston means further including a spool seal adjacent a first end thereof slidably sealing said inner chamber wall, defining a fixed volume main chamber between said spool gate and said spool seal, and a variable volume auxiliary chamber adjacent said first end, said piston means being responsive to force on said first end; bias means operative upon a second end of said piston means opposing force or said first end for urging said spool gate to an inlet port blocking position;

said auxiliary chamber including a dashpot means for damping the movement of said piston means in response to movement of said spool gate means toward said inlet port; wherein

said dashpot means is further operative to block a portion of said piston means first end from encountering fluid pressure directed to oppose said bias means at said inlet port blocking position;

a pilot conduit coupling with main chamber downstream of said fluid inlet port with said auxiliary chamber for providing constant fluid communication therebetween; and

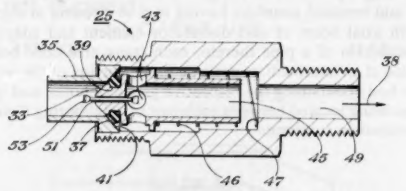
plunger means operative to engage said first piston end for urging said spool gate to an inlet port unblocking position.

4,080,988

COMBINATION EMPLOYING CONTROLLED FLOW CHECK VALVE

Cecil C. Robertson, Fort Worth, Tex., assignor to Malor Manufacturing, Inc., Fort Worth, Tex.

Filed Sep. 20, 1976, Ser. No. 723,971
Int. Cl.² F16K *15/02*
U.S. Cl. 137—513.3 **6 Claims**



1. In a combination including:

a. a communication conduit having a pressurized gaseous fluid therewithin; and

b. a smaller conduit sealingly connected with and communicating with the interior of said communication conduit; said smaller conduit having at least means for connecting with a test device for testing the pressure of said fluid; the improvement comprising:

c. a controlled flow check valve connected serially and sealingly with said smaller conduit and sealingly with and near said communications conduit; said controlled flow check valve including:

i. full flow passages with a poppet and seat means for allowing full flow in one direction and adapted for blocking reverse flow through the full flow passages; and

ii. a controlled flow bypass means allowing a controlled trickle reverse flow sufficient to permit testing but insufficient to bleed said pressurized fluid from said communication conduit in a short time; said bypass means comprising:

I. a passageway having smooth interior walls and a bore of a first diameter;

II. an insert closely fitted within said bore of said passageway; said insert having a second diameter so nearly completely filling said first diameter of said bore that less than

0.001 inch annular clearance is available for said reverse flow, and providing a clearance of at least 0.0001 inch for said reverse flow;

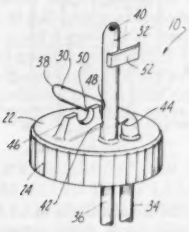
such that pressurized gaseous fluid can be flowed into said communication conduit and the pressure therein checked, yet said pressurized fluid will bleed off only at a trickle even if said smaller conduit with its said at least means for connecting with said testing device should develop a leak.

4,080,989

TUBE CONNECTOR FOR FLUID CONTAINER

Orest Chapelsky, Ann Arbor, and Norman A. Zausmer, Oak Park, both of Mich., assignors to Michlin Chemical Corporation, Detroit, Mich.

Filed May 19, 1976, Ser. No. 688,037
Int. Cl.[2] F16K *24/00*; F16L *55/14*
U.S. Cl. 137—588 **7 Claims**



1. A cap for a fluid container having means for joining a pair of fluid conduits to said container, comprising: a base adapted to be releasably secured to the container to close off an opening in the container; a pair of flexible tubing sections supported in the base so that their interiors form fluid passages through the base, and normally project away from the base in a direction opposite to the container; means formed on the base for releasably, simultaneously retaining both the tubing sections in a bent position wherein their walls are collapsed so as to close off fluid flow through them; and means carried by a first of said tubing sections for preventing placement of the second of said tubing sections into said means for retaining the tubing sections in a bent position, when the first of the tubing sections is supported within said means for retaining the tubing sections in a bent position.

4,080,990

SIX-WAY DEVIATOR VALVE FOR LIQUIDS

Franco De Benedetti, Turin, Italy, assignor to Gilardini S.p.A., Turin, Italy

Filed Jul. 9, 1976, Ser. No. 703,871
Claims priority, application Italy, Jul. 18, 1975, 68881 A/75
Int. Cl.[2] F16K *11/16*
U.S. Cl. 137—599.1 **11 Claims**

1. A six-way deviator valve for fluids, comprising:

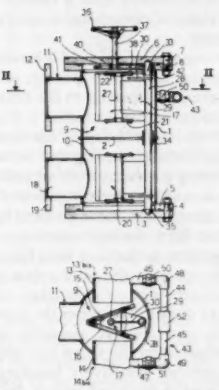
a cylindrical housing defining a central axis;

a baffle extending transversely to said central axis and dividing the interior of said housing into first and second cylindrical chambers;

a first set of three nozzles, each of which nozzles provides an hydraulic communication between the exterior of the housing and the interior of said first chamber, the nozzles defining respective axes, the axes of first and second nozzles of said first set being coincident and extending orthogonally to said central axis of the housing and the axis of the third nozzle of said first set being orthogonal to the axes of the first and second nozzles of the first set;

a second set of three nozzles, each of which nozzles provides an hydraulic communication between the exterior of the housing and the interior of said second chamber, the nozzles defining respective axes, the axes of first and second nozzles of said second set being coincident and extending orthogonally to said central axis of the housing and the axis of the third nozzle of said second set being orthogonal to the axes of the first and second nozzles of the second set;

a first obturator element for the first and second nozzles of said first set of nozzles, comprising two plane walls enclosing a predetermined angle to form an edge which is substantially orthogonal to the common axis of the first and second nozzles of said first set of nozzles, said first obturator element being arranged to rotate about an axis orthogonal to the common axis of the first and second nozzles of said first set of nozzles from a first position in which one of said plane walls is in contact with the edge of the first nozzle of said first set of nozzles and forms a right angle with the axis of the nozzle itself and the other plane wall of said first obturator element acts as a deflector to cause fluid entering the first chamber from the third nozzle of said first set of nozzles to change direction and be deflected towards the second nozzle of said first set of nozzles, to a second position in which said other plane wall is in contact with the edge of the second nozzle of said first set of nozzles and forms a right angle with the axis of the nozzle itself and said one plane wall of said first obturator element acts as a deflector to cause fluid entering the first chamber from the third nozzle of said first set



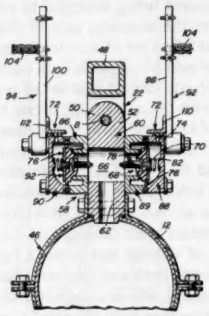
of nozzles to change direction and be deflected towards the first nozzle of said first set of nozzles; and

a second obturator element for the first and second nozzles of said second set of nozzles, comprising two plane walls enclosing a predetermined angle to form an edge which is substantially orthogonal to the common axis of the first and second nozzles of said second set of nozzles, said second obturator element being arranged to rotate about an axis orthogonal to the common axis of the first and second nozzles of said second set of nozzles from a first position in which one of said plane walls is in contact with the edge of the first nozzle of said second set of nozzles and forms a right angle with the axis of the nozzle itself and the other plane wall of said second obturator element acts as a deflector to cause fluid entering the second chamber from the third nozzle of said second set of nozzles to change direction and be deflected towards the second nozzle of said second set of nozzles, to a second position in which said other plane wall is in contact with the edge of the second nozzle of said second set of nozzles and forms a right angle with the axis of the nozzle itself and said one plane wall of said second obturator element acts as a deflector to cause fluid entering the second chamber from the third nozzle of said second set of nozzles to change direction and be deflected towards the first nozzle of said second set of nozzles.

4,080,991
CONTROL VALVE AND SPEED ADJUSTMENT FOR WATER DRIVE IRRIGATION SYSTEM

Jay C. Groelz, Phillips, Nebr., assignor to Heinzman Engineering, Inc., (Entire), Grand Island, Nebr.

Filed May 10, 1976, Ser. No. 684,865
Int. Cl.[2] A01G *25/09*
U.S. Cl. 137—624.13 8 Claims



1. For use in conjunction with a control system of water powered field irrigation equipment, a control valve comprising, in combination:

(a) a valve having a valve cap and a housing provided with an inlet opening, an outlet opening, and a flow passage connecting the inlet opening to the outlet opening;

(b) a valve element means including a diaphragm movably disposed in the valve housing for selectively blocking flow between the inlet opening and the outlet opening, the diaphragm being provided with an orifice;

(c) pilot valve means for regulating flow of fluid through the orifice and moving the valve element between a position blocking flow from the inlet opening to the outlet opening, and a position unblocking flow from the inlet opening to the outlet opening, the pilot valve means including a control port provided in the valve cap, with the diaphragm being disposed between the inlet opening and the control port, and a valve assembly including a crank pivotally mounted on the valve cap and provided with a projecting member selectively blocking and unblocking the control port as the crank pivots, the crank being connected to a control system of the irrigation equipment; and

(d) a motor speed control device connected to the control valve, the control device comprising, in combination:

(1) a fluid actuated timing motor including an eccentrically mounted output cam;

(2) a speed control push arm mounted on the cam;

(3) a pivotally mounted rocker arm connected to the push arm for pivotal movement thereby; and

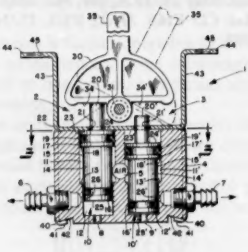
(4) valve control means connected to the rocker arm and to the crank of the control valve for regulating the timing of the blocking and unblocking of the outlet opening of the control valve.

4,080,992
THREE-POSITION, SELF-CENTERING VALVE FOR CONTROL OF FLUID ACTUATORS AND THE LIKE

Otto C. Niederer, Madison, Ohio, assignor to Design & Manufacturing Corporation, Willoughby, Ohio

Filed Jul. 12, 1976, Ser. No. 704,395
Int. Cl.[2] F16K *11/16*
U.S. Cl. 137—636 5 Claims

1. A fluid valve assembly comprising a valve body, a first bore in said valve body, a second bore in said valve body coaxially communicating with and of smaller diameter than said first bore, a control member selectively slidable in said first and second bores between two positions, one end of said control member being slidably sealed to said first bore by outwardly extending first seal means including a piston plate, the other end of said control means being only slightly smaller in diameter than said second bore and being slidably sealed to said second bore by second seal means at least partially contained within a radially inwardly extending groove in said control member, fluid inlet means in said body communicating with said first bore, fluid outlet means in said second bore selectively to deliver fluid from said second bore to an external device for operation of the same, vent means in said second bore, and actuator means to drive the control member from the first to second position, the fluid admitted to said first bore normally exerting pressure against the piston plate to urge the

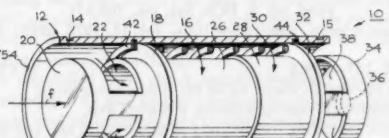


control member to the first position in which the fluid outlet means and vent means are in fluid communication with one another but are isolated from the fluid inlet means by said second seal means, the fluid pressure on said piston plate being overcome when the control member is slid by the actuator means to the second position in which the fluid inlet means and outlet means are in communication with one another via the first bore and limited clearance between the control member and second bore, but are isolated from said vent means by said second seal means, the fluid pressure in the first bore because of the limited clearance being sufficient to return the control member to the first position when the actuator means is released.

4,080,993
IN-LINE FLOW-CONTROL VALVE

Charles F. Lind, Jr., Los Angeles, Calif., assignor to Aqueduct, Inc., Los Angeles, Calif.

Filed Sep. 13, 1976, Ser. No. 700,407
Int. Cl.[2] G05D *7/01*
U.S. Cl. 137—504 3 Claims



1. A fluid-flow control valve for maintaining the flow of a fluid at a predetermined rate despite departures from a predetermined level in the pressure causing the fluid flow, including;

hollow, cylindrical casing means having a fixed axis;

a cylindrical, hollow upstream piston element having at least one fluid inlet port therein and having an outside diameter;

a cylindrical, hollow downstream regulator element having fluid side-exit ports and an axially aligned, flow-controlling exit orifice therein and having an inside diameter exceeding said outside diameter, said piston element being coupled telescopically within said regulator element to

provide the fluid flow path from said at least one inlet port to said side-exit ports and said exit orifice;

said casing means including internal means for supporting said upstream and downstream elements with their common axis coincident with said fixed axis and said casing means further including means for limiting the extent of the relative motion of said upstream and downstream elements;

spring means interposed between said upstream and downstream elements wholly external to said fluid flow path for urging relative motion therebetween along said fixed axis;

said upstream element having a skirt portion extending from said inlet ports to a region proximate to the upstream edges of said exit ports when said pressure causing said fluid-flow is at said predetermined level;

said upstream element being movable downstream and said downstream element being movable upstream;

said upstream and downstream elements being responsive to fluid pressure exceeding said predetermined level to effect relative movement therebetween in opposition to the restoring force of said spring whereby said skirt portion of said upstream portion covers, at least in part, said exit ports of said downstream element;

said axially aligned exit orifice having an area equal to one-eighth of the total area of said fluid side-exit ports.

4,080,994

CONTROL ARRANGEMENT FOR SUPPLYING PRESSURE FLUID TO AT LEAST TWO HYDRAULICALLY OPERATED CONSUMER DEVICES

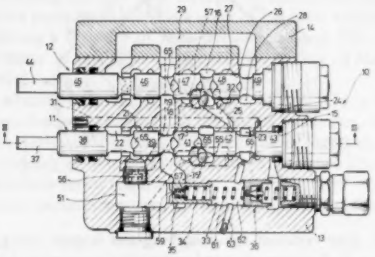
Heinz Flaschar, Asperg; Peter Kroll, Gemmrigheim; Petrus Thomassen; Heinz Kleinschmidt, both of Ditzingen, and Hugo Preun, Asperg, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Dec. 1, 1976, Ser. No. 746,323

Claims priority, application Germany, Jan. 16, 1976, 2601484

Int. Cl.[2] F15B *13/08*

U.S. Cl. 137—596.13 **19 Claims**



1. Control arrangement for supplying pressure fluid to at least two hydraulically operated consumer devices, comprising a source of pressure fluid; a supply conduit connected at one end to said source of pressure fluid; a return conduit connectable to the other end of said supply conduit to form therewith a neutral fluid circulating passage; a valve means for each of said consumer devices; at least one consumer conduit connected to each of said valve means, each of said valve means comprising an inlet chamber connectable to said consumer conduit thereof, a valve member movable between a neutral position preventing flow of fluid from said source of pressure fluid over said inlet chamber to said consumer conduit and a pair of working positions respectively connecting said consumer conduit with said source of pressure fluid or said return conduit while in said neutral position of all valve means said supply conduit is connected to said return conduit; a first branch conduit connecting a first point of said neutral circulating passage with the inlet chamber of one of said valve means; a second branch conduit connecting a second point of said neutral circulating passage downstream of said first point with the inlet chamber of the other valve means; a throttle in said neutral circulating passage between said first and said second point; a control valve provided with an associated throttle passage and being movable between a closed position and an open position in which it connects that neutral circulating passage upstream of said throttle with said return conduit; spring means biasing the control valve to said closed position; and a first control circuit communicating at one end with said control valve and at the other end with said neutral circulating passage downstream of said throttle and upstream of said other valve means, said control circuit passing through said one valve means to be controlled by the latter.

4,080,995

PULSATOR FOR MILKING MACHINES

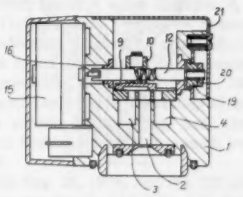
Karl Erik Olander, Sodertalje, Sweden, assignor to Alfa-Laval AB, Tumba, Sweden

Filed Aug. 27, 1976, Ser. No. 718,427

Claims priority, application Sweden, Sep. 4, 1975, 75098111

Int. Cl.[2] A01J *5/14*

U.S. Cl. 137—624.15 **5 Claims**



1. A milking machine pulsator comprising means forming a slide plane having an evacuation opening adapted for connection to a vacuum source, the slide plane also having at least one pulsation opening adapted for connection to a milking means, a slide adapted to be reciprocated along the slide plane to connect each pulsation opening alternately to the evacuation opening and to atmosphere, thereby providing a pulsing subatmospheric pressure, a motor operable at a constant rotational velocity, a spindle operatively connected to the motor for rotation thereby and having an endless, helically-shaped groove, and driving means engaged in said groove and connected to the slide for reciprocating the same along the slide plane during rotation of the spindle by the motor.

4,080,996

PRESSURE PULSE DAMPENER DEVICE

Abduz Zahid, Los Angeles, Calif., assignor to Greer Hydraulics, Inc., Los Angeles, Calif.

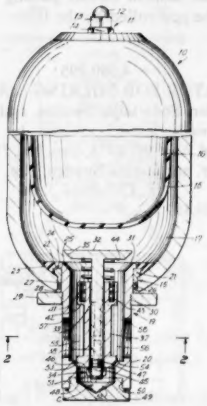
Filed Oct. 12, 1976, Ser. No. 731,815

Int. Cl.[2] F16L *55/04*

U.S. Cl. 138—30 **2 Claims**

1. An improved pressure pulse dampener comprising, in combination, a pressure vessel having a movable partition therein dividing said vessel into two chambers, a gas port in one said chamber for charging said one chamber with gas under pressure, an oil port formed in the other end of said vessel, a combined infeed and mounting assembly disposed in said oil port, said assembly including an integral, axially elongated hollow sleeve member open at both ends, an upper end portion of said sleeve member extending into said other chamber, seal means adjacent the upper end of said sleeve defining a fluid-tight connection between said sleeve member and said vessel, a partition member extending axially of said sleeve member and dividing the same into first and second, axially directed passages, a pair of fluid openings formed in the walls of said sleeve to opposite sides of said partition, the said fluid openings being in coaxial alignment, the axes of said openings being substantially normal to said partition, at least one by-pass opening formed in said partition in registry with said fluid

openings, said by-pass opening being of lesser diameter than the diameter of said openings, the axis of said by-pass opening being in parallel alignment with the common axis of said openings, a guide passage extending axially within said sleeve, said passage opening to the respective ends of said sleeve, a poppet valve member having a stem slidably disposed in said guide passage, said valve including a head seal means at the end of said stem nearest said oil port for defining a seal adjacent said port when the pressure in said one chamber exceeds the pressure in said other chamber by a predetermined amount, a tail



portion formed at the other end of said stem, a recess defining a well portion in said sleeve surrounding said tail portion of said stem, first and second restricted flow passages extending from said well portion and being in communication with said first and second axially directed passages, respectively, said restricted flow passages together with said well portion of said sleeve defining one of said open ends of said sleeve, and a closure plug threadedly received within said sleeve adjacent and in sealing relation to said well portion, said plug and well portion together defining the boundaries of a dampening and pressure equalizing chamber encompassing said tail portion.

4,080,997

FLOW STRAIGHTENER FOR A LIQUID FLOW

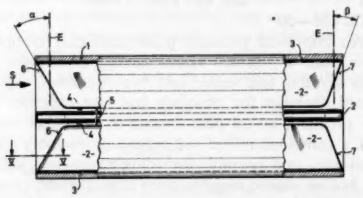
Peter Biornstad, Zurich, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Sep. 8, 1976, Ser. No. 721,489

Claims priority, application Switzerland, Sep. 16, 1975, 12004/75

Int. Cl.² D21F *1/06*; F15D *1/04*

U.S. Cl. 138—37 **6 Claims**



1. A flow straightener for a liquid flow comprising

a tube having an internal wall defining a flow path for the liquid flow, and

at least one rib secured to said wall within said tube, said rib extending parallel to said flow path and having a front edge relative to the liquid flow defining an acute angle with a plane perpendicular to said flow path, a trailing edge relative to the liquid flow defining an acute angle with a plane perpendicular to said flow path, and said rib having a longitudinal edge remote from an edge secured to said wall and disposed in spaced relation to the remainder of said wall to define a gap.

5. A flow straightener for a liquid flow comprising

a circular tube having an internal wall defining a flow path for the liquid flow, and

four ribs disposed in a cross pattern with a central gap therebetween, each said rib being secured to said wall within said tube in parallel to said flow path, each said rib having a front edge relative to the liquid flow defining an acute angle with a plane perpendicular to said flow path and a longitudinal edge remote from an edge secured to said wall and disposed in spaced relation to the remainder of said wall to define said gap.

4,080,998

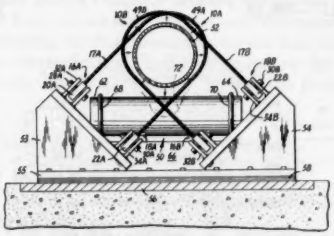
IMPACT ENERGY ABSORBING PIPE RESTRAINTS

Elia A. Mottola, North Andover; George H. East, Jr., Randolph; Norman A. Goldstein, Framingham; Wu-Cheng Huang, North Reading; John M. Peech, Cambridge; Shelden D. Pirotin, Melrose; Robert E. Roemer, Brighton, and Albert J. Spada, Wilmington, all of Mass., assignors to Stone & Webster Engineering Corporation, Boston, Mass.

Filed Jul. 7, 1976, Ser. No. 703,123

Int. Cl.² F16L *3/04*

U.S. Cl. 138—107 **7 Claims**



1. A pipe restraint for absorbing the impact energy of a ruptured high energy pipe and restraining movement thereof in at least one direction, comprising:

a laminated strap formed of a plurality of laminae of a material having the property of substantial elongation in the plastic state for absorbing the impact energy of a ruptured high energy pipe in at least one direction, said laminated strap being shaped to extend circumferentially around at least a portion of the high energy pipe with an arcuate portion formed therein positioned adjacent the high energy pipe and spaced therefrom to restrain movement of the ruptured high energy pipe in the direction of said arcuate portion;

anchoring means coupled to the ends of said laminated strap for anchoring said laminated strap to supporting structure; and

a restraining pipe positioned adjacent the high energy pipe and spaced therefrom, said restraining pipe being arranged substantially transversely to the longitudinal axis of the high energy pipe for restraining the movement of the ruptured high energy pipe in a direction different from that of said laminated strap.

4,080,999

FIBER REINFORCED SANDWICH TUBE

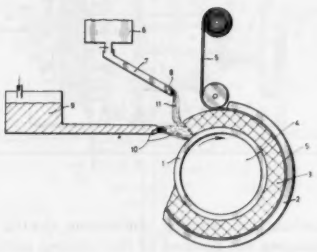
Hein Bulters, Vroomshoop; Gerrit Heidemann, Oldenzaal, and Warner Jan de Putter, Hardenberg, all of Netherlands, assignors to Industriele Onderneming Wavin N.V., Zwolle, Netherlands

Continuation of Ser. No. 443,558, Feb. 19, 1974, abandoned, which is a division of Ser. No. 248,161, Apr. 27, 1972, Pat. No. 3,799,818. This application Dec. 8, 1975, Ser. No. 638,399

Claims priority, application Netherlands, Apr. 29, 1971, 7105953

Int. Cl.[2] F16L *11/00*; B65H *81/00*

U.S. Cl. 138—125 14 Claims



1. A flexible tube manufactured by a method comprising the steps of:

(a) winding a fiber reinforced layer of thermosetting resin to provide and inner tube layer;

(b) providing a stream of free falling inorganic filler particles;

(c) spouting atomized resin transversly into the stream of free falling filler particles, thereby depositing the filler particles and resin onto the outside surface of the inner tube layer;

(d) rotating the inner tube layer in the path of the resin and filler particles to provide a layer of the resin and particles having a quantity of resin between 10 and 30% of the volume of this layer on the outside surface of the inner tube;

(e) winding on to the layer of resin and particles a fibrous non-woven or fabric layer permeable to the resin but not the particle for maintaining the particles together;

(f) winding over the permeable layer an outer fiber reinforced layer of resin; and

(g) simultaneously curing the applied layers of resin.

4,081,000

WEFT INSERTION NOZZLE ARRANGEMENT FOR A WEAVING MACHINE

Hans Peter Wollenmann, Ruti, Switzerland, assignor to Ruti Machinery Works Ltd., Ruti, Switzerland

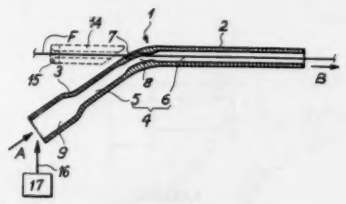
Filed Jan. 12, 1977, Ser. No. 758,763

Claims priority, application Switzerland, Jan. 26, 1976, 879/76

Int. Cl.[2] D03D *47/30*

U.S. Cl. 139—435 11 Claims

1. A nozzle arrangement for the insertion of weft threads into a shed in a weaving machine by means of a jet of fluid, said arrangement having at least one nozzle which comprises a weft thread entrance duct, a fluid conveying duct, and a transporting duct for guiding the weft thread and fluid therethrough, said fluid conveying duct and said transporting duct forming a main duct with the axes of the transporting duct and the fluid conveying duct forming substantially an obtuse angle, said thread entrance duct opening into the main duct with its axis in substantial alignment with the axis of the transporting duct, characterized in that the main duct has a portion therein of narrowed cross-section in the region where the thread entrance duct opens into it for entraining said thread when fluid is passing through said nozzle arrangement.



4,081,001

APPARATUS FOR PROPELLING THE WEFT THREAD CARRIERS IN TRAVELLING-WAVE LOOMS

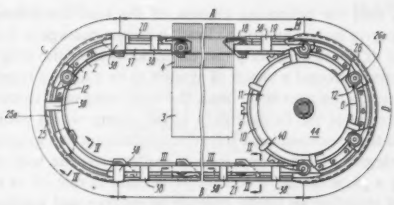
Valerian Alexeevich Borodin, ulitsa Gubkina, 4, kv. 74; Eduard Arshakovich Onikov, ulitsa Panferova, 5, korpus 2, kv. 106; Boris Alexandrovich Sakharov, ulitsa Krzhizhanovskogo, 24/35, korpus 6, kv. 404; Alexandr Alexandrovich Zabotin, Belyaevo-Bogorodskoe, kvartal 45, korpus 26, kv. 85, all of Moscow; Evgeny Dmitrievich Loschilin, ulitsa 8 Marta, 34a, Moskovskaya oblast, Domodedovo, and Alexandr Lvovich Galperin, ulitsa Moldagulovoi, 10, korpus 3, kv. 166, Moscow, all of U.S.S.R.

Filed Sep. 21, 1976, Ser. No. 725,350

Claims priority, application U.S.S.R., Sep. 23, 1975, 2170552

Int. Cl.[2] D03D *47/26*

U.S. Cl. 139—436 6 Claims



1. In a travelling wave loom having weft thread carriers and a cloth forming zone and apparatus for propelling the weft thread carriers, comprising: a closed stationary hollow guideway passing through said cloth forming zone and having two rectilinear and two curvilinear portions; a chain conveyer accommodated in said guideway; said weft thread carriers each having an outer surface, opposed end regions, and a top surface, and means for propelling the weft thread carriers mounted on said chain conveyer; side walls forming part of and being mounted on said guideway and contacting the outer surfaces of the weft thread carriers, said side walls including portions located at the curvilinear portions of said guideway which are of L-shaped configuration having upper flanges engaging said weft thread carriers; an additional guide situated above only one of the curvilinear portions and above the rectilinear portions of said guideway, except for a part thereof disposed in said cloth forming zone, said additional guide being situated in the plane of flight of the weft thread carriers and in contact with the top surfaces thereof; retainers arranged above the other curvilinear portion of said guideway on the inside thereof and movable in the plane of the flight of the weft thread carriers and in step with motion of said conveyer, said retainers contacting at least one of the end regions of the weft thread carriers; the upper surface of each of the weft thread carriers having an elongated flat surface and a shoulder extending therealong and defining therewith a space accommodating

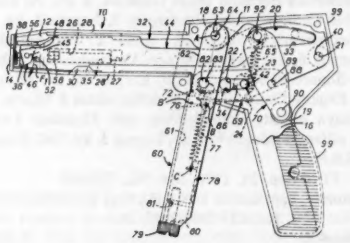
said additional guide, said one end region of each weft thread carrier being formed with a recess receiving one of said retainers.

4,081,002

TOOL FOR TIGHTENING CLAMPS

Mario Violi, Totes, France, assignor to Legrand S.A., Limoges, France

Filed Feb. 23, 1977, Ser. No. 771,395
Claims priority, application France, Feb. 27, 1976, 76 05486
Int. Cl.² B21F 9/02
U.S. Cl. 140—123.6 **13 Claims**



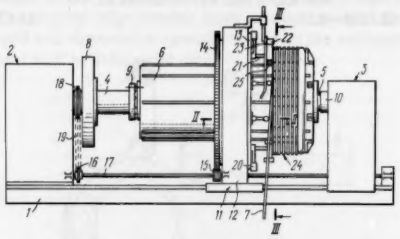
1. A tool for tightening clamps, of the kind comprising a flexible strip and an apertured head, having a passage in which the end of the flexible strip can be engaged after the strip has been passed around a bunch of articles to be clamped together and through the apertured head, the tool being used to cut-off that portion of the flexible strip of the clamp which projects beyond the apertured head following tightening to a greater or lesser degree of the clamp around the articles, the tool comprising a plate having a transverse portion at one of its ends formed to define an intake opening to receive said portion of the flexible strip of a clamp and at the other of its ends a fixed grip; a displacement member mounted for movement longitudinally of said plate and including means capable of gripping said portion of a clamp; a trigger pivotally mounted on said plate for movement relative to said fixed grip; coupling means including a swinging link provided between said displacement member and said trigger and including a release mechanism controlled by elastic calibrating means; a cutting lever pivotally mounted between a rest position where it leaves free said intake opening of said plate and a working position and with which are associated restoring means which draw said cutting levers in the direction of said rest position; said release mechanism comprising a cam having a cam surface with two separate stable zones separated from one another by an unstable zone and a cam follower maintained in contact with the cam surface of the cam by elastic calibrating means, said cam and said cam-follower being relatively movable within limits defined by said cam surface thereby to swing said cutting lever from said rest position into said working position, one of said cam and said cam-follower being fixed to said trigger and the other being provided on said swinging link of said coupling means provided between said trigger and said displacement member, said elastic calibrating means being coupled to said swinging link and said swinging link having engagement means engaged with complementary engagement means fixed to said cutting lever.

4,081,003

MACHINE FOR WINDING CONTINUOUS ELECTRIC WINDINGS

Yakov Zinovievich Checheljuk, Dnepropetrovskoe shosse, 62/65; Gennady Ivanovich Pshenichny, ulitsa Kremlevskaya, 27/8, and Nikolai Ivanovich Mykalo, ulitsa Relefnaya, 2/57, all of Zaporozhie, U.S.S.R.

Filed Dec. 16, 1976, Ser. No. 751,066
Int. Cl.² B21F 3/08
U.S. Cl. 140—92.2 **2 Claims**



1. A machine for winding continuous electric windings without changing the position of the winding sections, comprising:

a framework;

a first stock supported by said framework;

a second stock supported by said framework and being coaxial with said first stock;

a first center fastened externally of said first stock;

a second center fastened externally of said second stock;

a winding mandrel supported between said first and second centers;

fixing members mounted on said first center;

a sliding spindle mounted on said second stock for axial movement of the second center;

a carriage movable along the axis of said centers;

an annular housing supported by said carriage;

a rotatable annular base accommodated within said annular housing;

a plurality of wire-placing members fastened to said rotatable annular base and movable in two perpendicular directions, said wire-placing members having a first end and a second end;

an additional guiding member mounted on said first end of each of said wire-placing members to guide said wire into the winding section being wound;

a friction templet mounted on said annular housing;

a driving roller mounted on said second end of each of said wire-placing members and traveling in engagement with said friction templet; and

means accommodated within said driving roller to transmit rotation from said driving roller to the respective one of said additional guiding members.

4,081,004

WEIGHING HOPPER AND METHOD

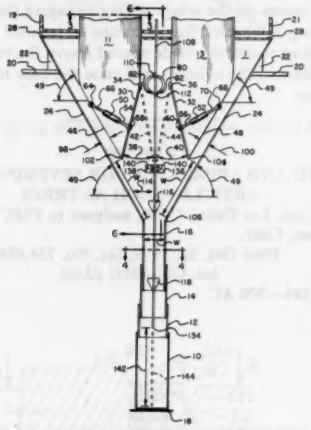
Thomas C. Harris, Dickinson, N. Dak. Assignor to Olinkraft, Inc., West Monroe, Louisiana 71291

Filed May 7, 1976, Ser. No. 684,433
Int. Cl.² B65B 1/06; B67D 5/06
U.S. Cl. 141—10 **10 Claims**

1. An improved hopper arrangement for use with a weighing scale of a bag packaging machine for filling a bag and for control of dust as the bag is being filled comprising:

(a) a first stationary frame; chute fixedly attached to said first stationary frame, said transition chute having formed thereon at the lower portion thereof, a vertically elongated throat section for being inserted into an open top of the bag;

(c) at least one weigh hopper associated with the weighing scale and extending into said transition chute;
(d) a movable elongated divider member movably mounted on said first frame within said transition chute with said at least one weigh hopper positioned on one side of said divider member, said divider member extending through said throat section;
(e) means for positioning the divider member intermediately in the throat section to provide a first path on one side of the divider member for materials to fall into the bag and to provide a second path on the other side of the divider



member for allowing escape of air and dust as the bag is being filled;
(f) means, associated with said transition chute for exhausting the interior of said transition chute, said throat section and the bag; and
(g) means movably mounting said elongated divider member on said first frame for moving the divider member between lowered and raised positions as the bag is being filled, said divider member in said lowered position extending into the bag, and said divider member in said raised position being wholly above the bag.

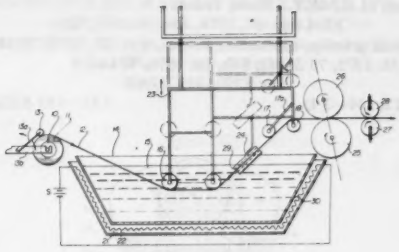
4,081,005

FLEXIBLE LEAD CHLORIDE CATHODE CONSTRUCTION

Thomas J. Gray, Halifax; Jan Wojtowicz, Dartmouth, and Max Baker, Halifax, all of Canada, assignors to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence, Canada

Filed Aug. 24, 1976, Ser. No. 717,455
Claims priority, application Canada, Feb. 2, 1976, 244744
Int. Cl.[2] H01M 7/00
U.S. Cl. 141—32 **10 Claims**

1. Apparatus for the manufacture of flexible electrode material, comprising:
(a) an open-topped container for a bath of molten coating material,
(b) means associated with the container for heating and melting the coating material,
(c) first guide means for supporting a roll of strip-shaped material above and adjacent one end of the container,
(d) second guide means for guiding said strip-shaped material on a path of travel extending downwardly from said first guide means and into the container,
(e) third guide means above and adjacent the other end of said container for guiding the strip-shaped material upwardly from the second guide means and out of the container,
(f) means for lowering said second guide means from an elevated position above the container through the open top of the container to an operating position within the container in which a corresponding portion of the strip-shaped material is immersed in the bath; and



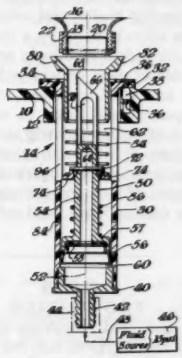
(g) drive means for advancing the strip-shaped material past the first, second and third guide means.

4,081,006

FLUID DISPENSING AND MIXING APPARATUS

John Arnold Crowell, Wilmington, and Jean René Boutin, Hockessin, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 11, 1976, Ser. No. 741,038
Int. Cl.[2] B07B 7/28
U.S. Cl. 141—330 **11 Claims**



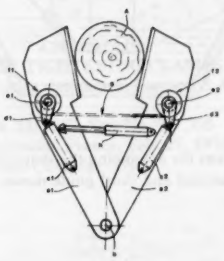
1. Apparatus for dispensing a first fluid from a container and mixing said first fluid with a second fluid comprising:
a housing having an axis,
a piston movable in said housing along said axis and dividing said housing into driving and mixing chambers,
said piston defining a first orifice interconnecting said chambers,
a piercing member secured to said piston,
means communicating with said mixing chamber to position a container of a first fluid on said axis of said housing for puncture by said piercing member, and
means for introducing a second fluid under pressure into said driving chamber for driving said piston along said axis to puncture said container positioned for puncture and to intermix said first fluid and said second fluid from said first orifice.

4,081,007

MACHINE FOR CUTTING DOWN AND SHAPING TREES

Jean Loigerot, Paris, France, assignor to Association pour la Rationalisation et la Mecanisation de l'Exploitation Forestiere (A.R.ME.F.), Paris, France

Filed Apr. 27, 1976, Ser. No. 680,768
Claims priority, application France, Apr. 29, 1975, 75 13328; Aug. 13, 1975, 75 25242; Feb. 20, 1976, 76 04838
Int. Cl.[2] A01G *23/08*
U.S. Cl. 144—3 D 3 Claims



1. In a tree-felling and shaping machine consisting of a support unit and a working unit adapted to be fitted to a self-propelling vehicle, said working unit comprising a movable frame supporting members for working on the tree, in which the working members comprise at least two bi-conical rollers mounted on the frame for moving the tree through stripping blades together with at least four pivoting stripping blades mounted on the frame for surrounding the tree trunk, and wherein said rollers and blades are so arranged that the axis along which the tree trunk is moved between the rollers coincides with the axis of the tree trunk between the blades, the improvement comprising:

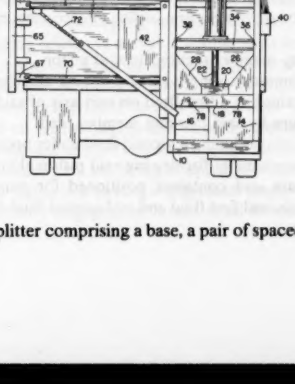
a cutting tool mounted on the frame and disposed below said rollers and said stripping blades, said cutting tool consisting of two cutting blades articulated about a common axis; two hydraulic jacks and tie rods respectively articulated on the cutting blades, the rods of each of said jacks actuating a corresponding tie rod; and winding rollers, one on each blade; a chain having opposed ends fixed to each of said rollers, whereby actuation of the connecting rods by means of said jacks causes the chain to wind on the rollers thereby closing the cutting blades, and another hydraulic jack, the body of which is fixed to one of the cutting blades with its rod being fixed to the other cutting blade, said other jack opening the cutting blades.

4,081,008

LOG SPLITTER

Roy Dilling, P.O. Box 2024, Fitchburg, Mass. 01420

Filed Apr. 22, 1976, Ser. No. 679,477
Int. Cl.[2] B27L *7/00*
U.S. Cl. 144—193 A 3 Claims



1. A log splitter comprising a base, a pair of spaced standards thereon, each standard being located at an opposite edge of the base, a support joining the standards at a point spaced from the base, a sharpened splitting blade, said blade extending between the standards at the side of the support toward the base, the base, blade, and support all being parallel,

a hydraulic cylinder on the support, a piston rod for the cylinder, means to supply fluid pressure to the cylinder to relatively extend said rod and said cylinder, means connecting the rod to the blade, means slidingly guiding the blade at its ends, said means including wings on the blade, said wings extending from the blade toward the support, and means on the wings sliding engaging the standards,

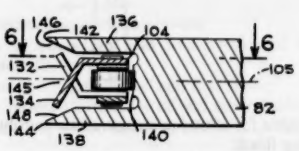
including a wheeled frame, means to connect the blade to the frame with the blade spaced above the base, whereby pressure in the cylinder will raise the base relative to the frame.

4,081,009

METHOD AND APPARATUS FOR SEVERING FIBROUS ARTICLES SUCH AS TREES

John Curlett, Los Gatos, Calif., assignor to FMC Corporation, San Jose, Calif.

Filed Oct. 22, 1976, Ser. No. 734,856
Int. Cl.[2] A01G *23/08*
U.S. Cl. 144—309 AC 27 Claims



1. An apparatus for severing a fibrous article such as a tree comprising, means defining a shear blade having a pair of spaced shear blade projections on its forward end and defining a groove therebetween having an open front and at least one open side through which fibers are removed, power means forcing said shear blade projection means into said article to penetrate and shear the article forcing broken and crushed fibers into said groove, and a driven fiber removing device having its fiber removing portion completely recessed in said groove for removing the crushed fibers from the groove as the shear progresses into the article.

4,081,010

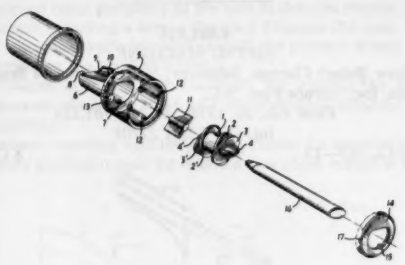
PENCIL SHARPENER FOR NON-CIRCULAR SECTION PENCILS

Luigi Galli, Milan, Italy, assignor to Fabrica Italiana Lapis ed Affini (Fila) SpA, Italy

Filed Feb. 19, 1976, Ser. No. 659,364
Claims priority, application Italy, Feb. 19, 1975, 20427 A/75
Int. Cl.[2] B43L *23/00*
U.S. Cl. 145—3.1 9 Claims

1. A sharpener for a pencil non-circular in cross section comprising, a housing, a rotatable element in said housing having means for defining a bore for receiving therein a pencil of non-circular cross section extending axially therein for rotation with said pencil therein, said bore being configured in cross section to maintain said pencil from rotation relative to said rotatable element upon rotation of said pencil, means for defining an extension on said housing defining a space for receiving in use a leading portion of said pencil extending axially therein, a blade mounted on said extension having a cutting edge inclined relative to a longitudinal axis of said housing, means on said rotatable element for rotatably guiding said rotatable element for rotation with said pencil therein

eccentrically relative to said longitudinal axis and for engaging said pencil with said cutting edge for thereby cutting a tapered,



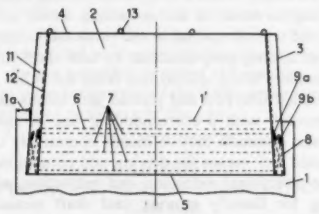
non-circular tip on said pencil upon rotation thereof for sharpening.

4,081,011

TUBULAR CONTAINER WITH SUSPENSION ELEMENTS

Walter Krause, D-7121 Waldheim (Wurttemberg), Germany

Filed Jan. 17, 1977, Ser. No. 759,854
Claims priority, application Germany, Mar. 12, 1976, 7607644
Int. Cl.[2] A45C *9/00*
U.S. Cl. 150—1 **10 Claims**



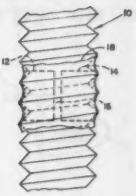
1. A container of a pliable material, comprising a tubular wall having an upper marginal portion and an upper edge; an upper end wall connected to said marginal portion of said tubular wall; and two lifting sleeves located opposite and substantially parallel to one another and connected to said marginal portion of said tubular wall, each of said lifting sleeves forming a loop continuously extending in a transverse direction of said tubular wall and having an inferior extending in said transverse direction, each of said lifting sleeves having two side edge portions spaced from one another in a transverse direction and laterally bounding said interior, each of said side edge portions being provided with a hem fixedly connected to said marginal portion of said tubular wall by means of seams comprising at least two first seams extending in a longitudinal direction of said lifting sleeves and spaced from one another in said transverse direction and at least two second seams intersecting one another and extending between said first seams at an angle to the latter, each of said second seams having an upper end portion closest to said upper edge of said tubular wall and provided with a locking seam extending substantially parallel to the locking seam of the other second seam.

4,081,012

THREAD LOCK

Richard B. Wallace, Bloomfield Hills, Mich., assignor to The Oakland Corporation, Troy, Mich.

Continuation-in-part of Ser. No. 550,831, Feb. 18, 1976. This application Apr. 12, 1976, Ser. No. 675,789
The portion of the term of this patent subsequent to Nov. 22, 1994, has been disclaimed.
Int. Cl.[2] F16B *39/02*
U.S. Cl. 151—14.5 **9 Claims**



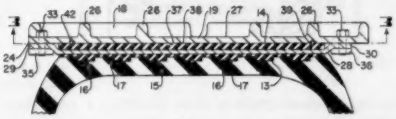
1. A thread lock construction comprising a body having threads formed thereon, a deposit of one part of a two-part friction and locking material in the thread grooves at a first zone comprising a plurality of consecutive threads on said body, said deposit extending only partially around said threads, a second deposit of the other part of said material on substantially the same consecutive threads and extending only partly around said threads at a second zone circumferentially adjacent said first zone, at least one pair of edges of said deposits being adjacent each other, said deposits being fluid and capable of being spread by engagement with a mating threaded body, a narrow barrier zone of solid material formed by reaction between contacting edge portions of said deposits and in contact with the adjacent edge portions of the still-fluid deposits and constituting a barrier therebetween, and a rupturable thin film of dry non-tacky protective material overlying both of said deposits and barrier zone engaged with a mating threaded member, at least one of said deposits including 10–90% by volume of finely divided solid resin particles.

4,081,013

TRACTION SHOE SEAL

Eugene T. Herman, Saint Marys, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Jan. 5, 1976, Ser. No. 646,555
Int. Cl.[2] B60C *27/20*
U.S. Cl. 152—179 **14 Claims**



1. A traction shoe for mounting on a longitudinally extending belt of a belt-type removable track for an annular resilient tire comprising a plate member having an elongated, generally rectangular shape, said plate member having a belt-engaging surface with transversely extending side edges and longitudinally extending end edges, a groove in said belt-engaging surface extending transversely of said plate member at a position adjacent at least one of said side edges and a separate sealing member of resilient material disposed in said groove, said belt having a plate-engaging surface, said separate sealing member having a thickness greater than the depth of said groove whereby upon mounting of said shoe on said belt with said belt-engaging surface pressed into engagement with said plate-engaging surface of said belt said separate sealing member will resiliently engage said plate-engaging surface and

prevent ingress of soil and rock between said plate-engaging surface and said belt-engaging surface.

4,081,014

PNEUMATIC TIRE AND WHEEL RIM ASSEMBLIES

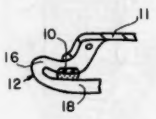
Eric Henry Searle, Sutten Coldfield, England, assignor to Dunlop Limited, England

Filed Jul. 23, 1976, Ser. No. 708,174

Claims priority, application United Kingdom, Aug. 2, 1975, 32390/75

Int. Cl.² B60C *17/00, 17/04*

U.S. Cl. 152—330 L **11 Claims**



1. A pneumatic tire and wheel rim assembly capable of being driven with the tire deflated comprising

at least one circumferentially extending band of rubber or plastics material containing magnetized particles, said band being on an interior surface of the assembly which contacts and is required to move relative to a further such surface when the tire is deflated and

a liquid lubricant containing magnetized particles and maintained in position by the band to facilitate relative movement between the contacting surfaces within the assembly when the assembly is driven with the tire deflated.

4,081,015

WHEEL RIMS AND PNEUMATIC TIRE AND WHEEL RIM ASSEMBLIES

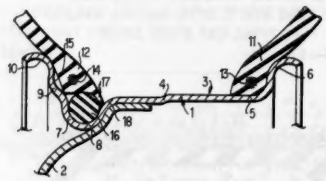
William Eric Mitchell, Coventry, England, assignor to Dunlop Limited, London, England

Continuation of Ser. No. 559,724, Mar. 19, 1975, abandoned. This application Sep. 28, 1976, Ser. No. 727,617

Claims priority, application United Kingdom, Mar. 28, 1974, 13906/74

Int. Cl.² B60C *15/02*

U.S. Cl. 152—379.1 **3 Claims**



1. A pneumatic tire and wheel rim assembly comprising:

(i) a wheel rim having a pair of annular tire bead retaining flanges and a well located adjacent one of said flanges immediately beneath the normal seating position of a tire bead, said well having a base portion substantially semi-circular in axial cross-section;

(ii) a well-fitting ring, substantially circular in transverse cross-section, located in the well to substantially fill said well;

(iii) a pneumatic tire on said wheel rim, said tire having a pair of beads having toe portions, the base of one of said beads extending over the well and being supported by said well-filling ring; and

(iv) the well-filling ring defines with the axially inner surface of the well a circumferential radially inwardly tapering groove which, in the event of said one tire bead being axially displaced from its seat, is entered by the toe portion of said one tire bead to prevent further axial displacement of said one bead.

4,081,016

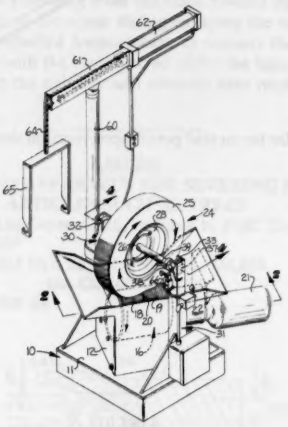
SIPING MACHINE

Andrew Robert Clayton, Salisbury, N.C., assignor to Brad Ragan, Inc., Spruce Pine, N.C.

Filed Jun. 30, 1976, Ser. No. 701,234

Int. Cl.² B29H *21/08*

U.S. Cl. 157—13 **3 Claims**



1. In a tire siping machine having a spirally threaded drum mounted for rotation about a first axis, knife means projecting from said drum for cutting a tire brought into engagement with said drum, and tire mounting means for supporting a tire in engagement with said drum and including shaft means defining a second axis about which a tire rotates during drum engagement, the improvement in said mounting means which comprises first and second extensible and retractable column members each extending perpendicular to said shaft means, said column members being spaced one from the other for straddling a mounted tire; first and second jack means each operatively connected with a corresponding one of said column members; and common motive means operatively connected with both said jack means for driving said column members in parallel, co-directional extension and retraction; said means cooperating for linearly moving said shaft means laterally relative to said drum while maintaining said second axis in constant predetermined skew relation to said first axis.

4,081,017

APPARATUS FOR GROOVING TIRES

Paul E. Appleby, Cuyahoga Falls; Max D. Brinkley, North Canton, and Clement C. Smith, Akron, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Sep. 27, 1976, Ser. No. 727,079

Int. Cl.² B29H *21/08*

U.S. Cl. 157—13 **11 Claims**

1. A machine used for grooving a tread of a tire, comprising:

(a) a main frame for supporting other components of the machine;

(b) a primary frame slidably mounted on the main frame;

(c) a secondary frame slidably mounted on the main frame in spaced relation from the primary frame;

(d) means coupling the primary and secondary frames together for unitary movement and for movement relative to each other on the main frame;

(e) a cam rotatably mounted on the secondary frame, the cam having a curved outer periphery corresponding to

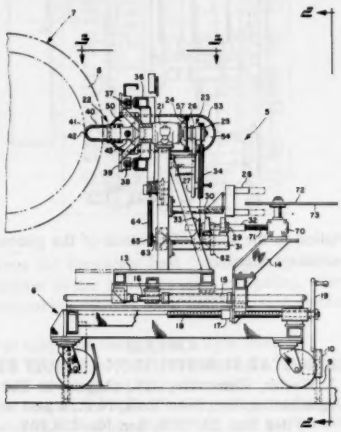
the transverse curvature of the bottom of the groove desired to be cut in the tread of a tire;

(f) means, mounted on the primary frame, for monitoring the curved outer periphery of the cam as the cam rotates, said means including a sensor disposed adjacent the cam;

(g) a heatable knife, associated with the primary frame, for grooving the tread of a tire;

(h) means, coacting with the knife, for guiding the knife transversely of the tread of a tire positioned adjacent the machine;

(i) means, coacting with the primary frame, for mounting the knife guiding means for rotation in a plane which is nor-



mal to the direction in which the knife guiding means moves to and from a tire positioned adjacent the machine, said rotation means including means for rotating the knife guiding means to different arcuate positions;

(j) means, associated with the knife-guiding means, for moving the knife therealong transversely of the tread at a predetermined desired speed which is correlated to the rotation of the cam, the sensor coacting with the cam to cause correlated movement of the primary frame to and from the tire mounted adjacent the machine, whereby a groove is cut in the tread of the tire in accordance with the curved outer periphery of the cam.

4,081,018

STORM DOOR AND SCREEN COMBINATION FOR A GARAGE

Henry S. Szwartz, Suffern, N.Y., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Jun. 23, 1977, Ser. No. 809,378
Int. Cl.[2] E06B *3/48*
U.S. Cl. 160—113 **1 Claim**

1. A storm door and screen combination for a garage having a wall with a doorway formed therethrough, said storm door and screen combination comprising

an awning extending substantially perpendicularly from the wall over the top of the doorway;

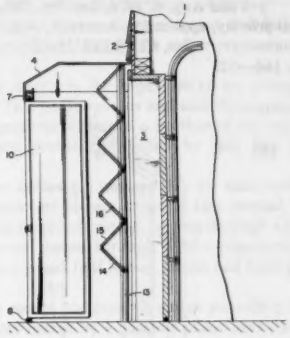
a pair of sides extending substantially perpendicularly from the wall at the sides of the doorway from the awning to the bottom of the doorway;

an upper guide track extending substantially horizontally along the edge of the awning farthest from the garage;

a lower guide track extending substantially horizontally between the sides at the bottoms thereof in a plane with the upper guide track substantially parallel to the wall of the garage;

a plurality of storm door sections hingedly affixed to each other along substantially vertical lines and slidably mounted in the upper and lower guide tracks for positioning in a plane parallel to the wall of the garage thereby completely enclosing the doorway and in accordion fashion to provide a desired opening;

a pair of side guide tracks extending substantially vertically along the sides each facing the other in a plane substantially parallel to the wall of the garage; and



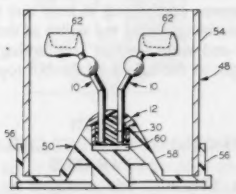
a plurality of screen sections hingedly affixed to each other along substantially horizontal lines and slidably mounted in the side guide tracks for positioning in a plane parallel to the wall of the garage thereby completely screening the doorway and in accordion fashion to provide a desired opening from the ground.

4,081,019

SYNTHETIC RESIN PREFORM AND SPRUE ASSEMBLY AND METHOD OF MAKING SAME

Frank M. Kulig, Bloomfield, Conn., assignor to The J. M. Ney Company, Bloomfield, Conn.

Filed Dec. 11, 1975, Ser. No. 639,877
Int. Cl.[2] B22C *7/02, 9/04*
U.S. Cl. 164—34 **19 Claims**



1. In a method of making an investment mold, the steps comprising:

a. mounting a synthetic resin preform having a plurality of circular cross section recesses in its exposed surface on a crucible former;

b. inserting into a plurality of said recesses in said preform respective ones of a plurality of elongated synthetic resin sprue pins each having a conduit portion having a circular cross section end portion, said recesses and said circular cross section end portions being relatively sized so that said end portions are coaxially aligned with said recesses to seat the respective end portions for rotation within a respective one of said recesses, said sprue pins further having a bend and an enlarged reservoir portion intermediate its length;

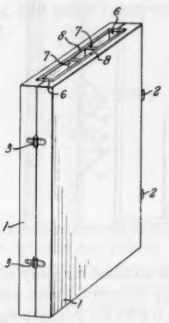
c. mounting patternson the free ends of said sprue pins, and

d. orienting the patterns by adjusting the angular orientation of said sprue pins by rotating said sprue pins about said end portions relative to said synthetic resin preform.

4,081,020
MOULD ASSEMBLIES FOR USE IN CASTING MOLTEN METALS

Kerry Arthur Cattell; Roy Spencer Moore, and Jim Pearce, all of Padstow, Southwales, Australia, assignors to Foseco International Limited, Birmingham, England

Filed Aug. 6, 1976, Ser. No. 712,581
Claims priority, application Australia, Aug. 8, 1975, PC2696
Int. Cl.[2] B22D *23/02*
U.S. Cl. 164—122 7 Claims



1. A mould assembly for casting molten metal, comprising a book mould formed from two mould halves hinged together along one edge, and together defining an upwardly open continuous mould cavity of substantially rectangular cross-section with a length at least six times its width, means for holding the two halves together, and a hot top lining preformed of hot top lining material in contact with the walls of the head of the cavity and terminating short of the continuous moulding cavity defined by said mould halves, wherein the improvement comprises

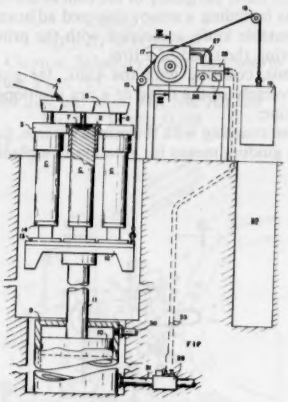
means for preventing bowing of the hot top lining material adjacent the longer walls of the cavity away from the longer walls so that substantially all of the hot top lining material adjacent the longer walls of the cavity is maintained in contact with those longer walls, said bow-preventing means comprising at least one bridge of hot top lining material spanning the width of the hot top intermediate the end walls thereof and having substantially the same height as the height of the hot top lining material.

4,081,021
SEMI-CONTINUOUS DIRECT CHILL CASTING APPARATUS

Reed G. Bills, Glendale, Ariz., assignor to Reynolds Metals Company, Richmond, Va.

Filed Jan. 13, 1976, Ser. No. 648,734
Int. Cl.[2] B22D *11/00*
U.S. Cl. 164—154 2 Claims

1. Casting apparatus comprising means for feeding molten material, a mold receiving the molten material in which the molten material solidifies forming a casting advancing at a substantially constant speed through the mold, a cylinder, means including a piston operable in the cylinder ahead of the advancing casting limiting the speed of advance of the casting, means including a fluid pressure system for controlling the speed of advance of the piston in the cylinder by differential pressure on opposite ends of the piston, a control device having electric control means settable for the desired speed of advance of the piston, a signal device responsive to the actual speed of advance of the piston, said control device and said signal device respectively comprising direct current control and signal circuits at voltages which are balanced against each other with the aid of connections between the control device and the signal device, the differential between the two voltages being a measure of said differential pressure said fluid pressure system including a servo flow control valve which is responsive to said differential between the two voltages to correct

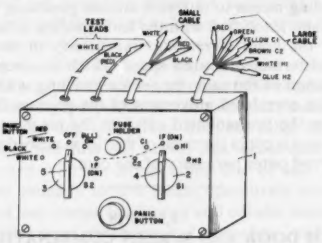


any deviation in the speed of advance of the piston from the desired constant speed.

4,081,022
THERMOSTAT SUBSTITUTION CIRCUIT DEVICE

Sanfrid J. Wester, Huntsville, Ala., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Oct. 27, 1976, Ser. No. 736,201
Int. Cl.[2] H01H *41/00*
U.S. Cl. 165—11 1 Claim



1. A thermostat substitution circuit device for substituting for a thermostat in testing of heating and cooling system circuitry, said thermostat substitution circuit device comprising

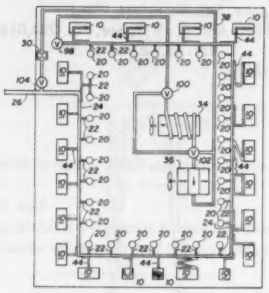
a housing; and

first and second wafer switches in the housing, each having a control member outside the housing for manual operation and a plurality of electrical contacts inside the housing, selected contacts of the first wafer switch being electrically connected to a cable for independent electrical connection to first and second stage cooling lines, a fan, a source of voltage and first and second stage heating lines, selected contacts of the second wafer switch being electrically connected to a pair of test leads and being electrically connected to a cable for independent electrical connection to defrost checking circuits, selected contacts of the first and second wafer switches being connected to each other whereby a user substitutes thermostatic operation by selective operation of the control members of the first and second wafer switches after connection of the leads and the leads of the cables to the corresponding lines and circuits.

4,081,023
HEAT PIPES TO USE HEAT FROM LIGHT FIXTURES

Fred Edelstein, Hauppauge; Robert A. Haslett, Dix Hills, and Odd E. Sangesland, Plainview, all of N.Y., assignors to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Nov. 26, 1976, Ser. No. 745,385
Int. Cl.[2] F28D *15/00*
U.S. Cl. 165—53 4 Claims



1. A system for removing heat from lighting fixtures and providing means to use or reject same in heating, ventilating and air conditioning devices for a building, said system comprising:

a means to take heat away from a light fixture;

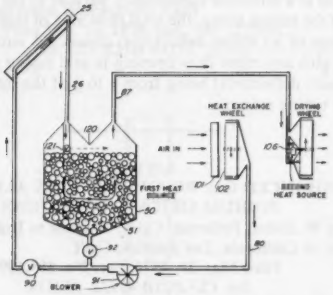
a means to transfer the heat from the light fixture to a fire protection water sprinkler system; and

a means to control the utilization or rejection of such heat in the building's heating, ventilating and air conditioning devices.

4,081,024
AIR CONDITIONING APPARATUS AND METHOD

William F. Rush, Arlington Heights; Jaroslav Wurm, N. Riverside, and Raymond J. Dufour, Wheaton, all of Ill., assignors to Gas Developments Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 415,323, Nov. 13, 1973, Pat. No. 3,889,742. This application Jun. 4, 1975, Ser. No. 583,522
Int. Cl.[2] F25B *13/00*
U.S. Cl. 165—62 10 Claims



1. An open-cycle air conditioning apparatus for heating and cooling comprising:

an enclosure defining a treatment air passageway and a separate regenerative air passageway;

means for passing an air stream through each of said passageways;

a sensible heat exchanger means for transfer of thermal energy from one of said passageways to the other;

a desiccant means for transfer of moisture from the air treatment passageway to the regenerative air passageway and spaced toward the exhaust of the regenerative air stream from said heat exchanger means;

a first evaporative cooling means near the exit of the conditioned air passageway and a second evaporative cooling means near the entrance of the regenerative air passageway;

a first heater means in the regenerative air passageway between said sensible heat exchanger means and said desiccant means supplying heat to the entire regenerative air stream;

a second heater means in the regenerative air passageway between said first heater means and said desiccant means supplying regeneration heat to a portion of the regenerative air stream previously heated by said first heater means;

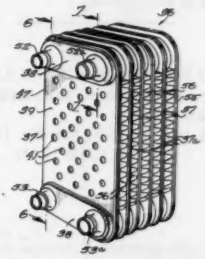
a baffling means defining a passageway for said portion of the regenerative air stream through said second heater means and said desiccant means, passing through a portion of said desiccant means through which regenerative air stream heated by said first heater means had been passed; and

a heat collector means and conduit means providing heat to said first heater means by a gaseous phase heat exchange medium.

4,081,025
MULTIPLE FLUID STACKED PLATE HEAT EXCHANGER

Desmond M. Donaldson, Halton, Canada, assignor to Borg-Warner Corporation, Chicago, Ill.

Division of Ser. No. 473,254, May 24, 1974, Pat. No. 4,002,201. This application Sep. 27, 1976, Ser. No. 726,717
Int. Cl.[2] F28F *3/08*
U.S. Cl. 165—140 16 Claims



1. A multiple fluid heat exchanger of the stacked plate type, comprising a first set of plates with each plate having an elongated enlarged fluid header extending the full width of the plate at each end thereof, an inlet in one header for receiving a first fluid and an outlet in the other header, a core portion of a lesser thickness than said headers defining a fluid passage interally of each plate communicating between said headers, said first set of plates being arranged so that all of said fluid inlets are in registry with each other and all of said outlets are in registry with each other, a second set of plates interleaved between said first set of plates, each of said second plates including an elongated enlarged fluid header extending the width of the plate at each end thereof, an inlet in one header for receiving a second fluid and an outlet in the other header, a core portion of a lesser thickness than said headers defining a fluid passage internally of each second plate communicating between said headers, said second set of plates arranged so that all of said fluid inlets are in registry with each other but laterally displaced from said fluid inlets of said first set of plates, and that all of said fluid outlets are in registry with each other but laterally displaced from said fluid outlets of said first set of plates, and a plurality of heat exchange surfaces positioned between said core portions of the first and second sets of plates

in heat exchange relationship with both sets of plates so as to direct a third fluid across said heat exchange surfaces.

4,081,026

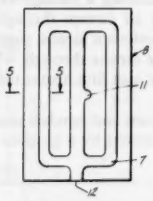
HOLLOW ARTICLE

Charles A. Kleine, Florissant, Mo., and Verne L. Middleton, East Alton, Ill., assignors to Olin Corporation, New Haven, Conn.

Division of Ser. No. 632,645, Nov. 17, 1975, Pat. No. 4,021,901, which is a continuation-in-part of Ser. No. 573,953, May 2, 1975, Pat. No. 4,021,901. This application Aug. 3, 1976, Ser. No. 711,286

Int. Cl.² F28F *3/14;* F25B *39/02;* F24J *3/02;* B23P *17/00*

U.S. Cl. 165—170 **16 Claims**



1. A hollow article having a planar structure containing a desired system of internal tubular passageways in a predetermined pattern for flow of a heat exchange medium therethrough defining at least one header connected by connecting portions of said passageways extending therefrom, said passageways including at least one opening extending from said header to permit the flow of fluid therethrough, wherein said connecting portions further define a nib-like marker structure adapted to serve as an alignment means in the sizing of the final linear dimensions of said article.

4,081,027

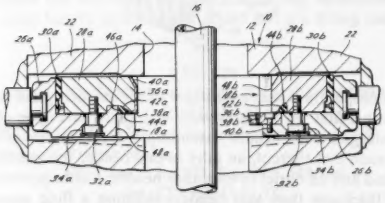
SHEAR RAMS FOR HYDROGEN SULFIDE SERVICE

Thomas X. T. Nguyen, Beaumont, Tex., assignor to The Rucker Company, Houston, Tex.

Filed Aug. 23, 1976, Ser. No. 716,502

Int. Cl.² E21B *19/00*

U.S. Cl. 166—55 **15 Claims**



1. A blowout prevent comprised of,

a body having a bore therethrough for passage of a drill string and including at least one ram receiving chamber extending laterally from the bore,

a first ram movably disposed in the ram receiving chamber, the ram including a shear blade projecting inwardly toward the drill string,

means to actuate the first ram into and away from the bore,

a second ram in the body having an engaging face arranged to engage the drill string and to coact with the shear blade to shear the drill string,

the first and second rams formed of a material having an upper hardness level of about Rc22, and

the shear blade's shearing surface and the engaging face of the second ram being formed of a layer of an alloy selected from the group consisting of nickel-based alloys, cobalt-based alloys, and tungsten-based alloys welded to the first and second rams, the layer being thin enough so that it does not peel off in use and avoids warping of the rams when being welded to them, the alloys having a hardness sufficient to shear the drill string.

4,081,028

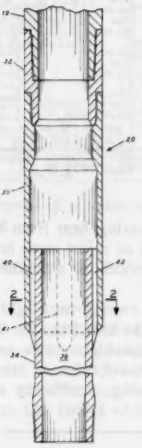
STEAM DISTRIBUTION SYSTEM FOR USE IN A WELL

Earl E. Rogers, Bakersfield, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Apr. 4, 1977, Ser. No. 784,014

Int. Cl.² E21B *17/14*

U.S. Cl. 166—242 **1 Claim**



1. A steam injection system for injecting steam into a well at a plurality of different vertical intervals comprising a tubing string having a known cross-sectional flow area and at least one steam deflector connected into said tubing string adjacent at least the upper interval that is to be steamed for directing a portion of the steam down the interior of said tubing string and a portion of the steam out of the steam deflector through bypass flow openings therein into the well liner-tubing string annulus adjacent at least the upper interval that is to be steamed in a direction substantially parallel to the longitudinal axis of the tubing string, the total flow area of said bypass flow openings of all steam deflector(s) connected into said tubing string plus any other flow opening in said tubing string below the steam deflector(s) being from $\frac{1}{3}$ to $\frac{2}{3}$ of the total flow area of the tubing string.

4,081,029

ENHANCED OIL RECOVERY USING ALKALINE SODIUM SILICATE SOLUTIONS

LeRoy W. Holm, Fullerton, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Filed May 24, 1976, Ser. No. 689,199

Int. Cl.² E21B *43/22, 33/138*

U.S. Cl. 166—270 **7 Claims**

1. A process for the enhanced recovery of oil form a heterogeneous subterranean reservoir penetrated by at least one injection well and at least one production well spaced therefrom which comprises:

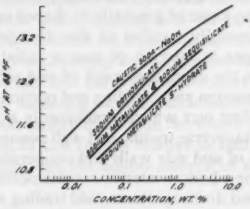
(a) alternately injecting through the injection well and into the reservoir small slugs of:

(1) a dilute aqueous solution of an alkaline alkali metal silicate having a molar ratio of M_2O/SiO_2 of 1 or above wherein M is an alkali metal atom which aqueous solution of alkaline alkali metal silicate reduces the interfa-

cial tension of said oil with water at high pH to about 0.1 dyne/cm or less;

(2) water;

(3) a dilute aqueous solution of a water-soluble material



that reacts with the alkali metal silicate to form a precipitate;

(4) water; and

(b) injecting about 0.1 to about 1 reservoir pore volume of a dilute aqueous solution of said alkaline alkali metal silicate.

4,081,030

AQUEOUS BASED SLURRY WITH CHELATING AGENT AND METHOD OF FORMING A CONSOLIDATED GRAVEL PACK

David R. Carpenter, Houston, Tex., and Vernon G. Constien, Owasso, Okla., assignors to The Dow Chemical Company, Midland, Mich.

Filed Nov. 1, 1976, Ser. No. 737,455
Int. Cl.² E21B *33/138*
U.S. Cl. 166—276 **24 Claims**

1. In a slurry suitable for use in emplacing a permeably consolidated particulate mass in communication with a permeable subterranean formation, of the type containing an epoxy resin-solvent mixture, a curing agent for the epoxy resin, a particulate material, a coupling agent, a quaternary ammonium halide surfactant, and an aqueous carrier fluid, the improvement which comprises; an effective amount of an agent in said slurry for chelating polyvalent metal cations.

4,081,031

OIL WELL STIMULATION METHOD

Henry H. Mohaupt, Santa Barbara, Calif., assignor to Kine-Tech Corporation, Sacramento, Calif.

Filed Sep. 13, 1976, Ser. No. 722,795
Int. Cl.² E21B *43/26, 37/00*
U.S. Cl. 166—299 **1 Claim**

1. The process for stimulating the flow of oil in an oil well comprising the steps of

creating in the bore of said well at a strata of known oil production,

a first gas pressure-volume pulse comprising a plurality of overlapping gas pressure-volume pulses of approximately equal magnitude, sequentially propagating up the longitudinal axis of said bore,

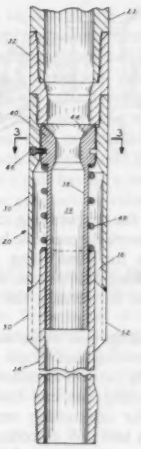
creating simultaneously in the bore of said well and spaced apart from and above said first gas pressure-volume pulse, a second pressure-volume pulse comprising a plurality of overlapping pressure-volume pulses of approximately equal magnitude and approximately equal in characteristics to said first pressure-volume pulse, sequentially propagating down the longitudinal axis of said bore.

4,081,032

STEAM DEFLECTOR FOR USE IN A WELL

Stanley O. Hutchison, Bakersfield, and Glenn W. Anderson, Oildale, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Mar. 31, 1977, Ser. No. 783,135
Int. Cl.² E21B *43/00*
U.S. Cl. 166—317 **1 Claim**



1. Steam deflector apparatus for directing steam flow from the interior of a tubing string into a well in a direction concentric with and substantially parallel to the longitudinal axis of the tubing string comprising an outer tubular skirt section, means for connecting the upper end of said skirt section to a tubing string, an inner tubular section of substantially smaller outer diameter than the inner diameter of said skirt section having the upper portion thereof extending coaxially interiorly of the lower portion of said skirt section and forming an annular chamber between said skirt section and said inner tubular section, said annular chamber being substantially concentric with the parallel to the longitudinal axis of said tubing string, a sliding sleeve section having a central opening through its entire length, said sliding sleeve section having an elongated lower portion slidably engaged inside of said inner tubular section for coaxial travel between an up position and a down position in said inner tubular section and an upper collar portion having an outer diameter substantially equal to the outer diameter of said inner tubular section, said collar portion being engageable in the up position against the inside of said outer tubular skirt section, a ball seat in said sliding sleeve section adjacent the central opening thereof, means disconnectably connecting said sliding sleeve section in said up position thereby substantially blocking off said annular chamber to flow from the inside of said tubular skirt section, means in said annular chamber connecting said inner tubular section to said skirt section while maintaining the cross-sectional flow area

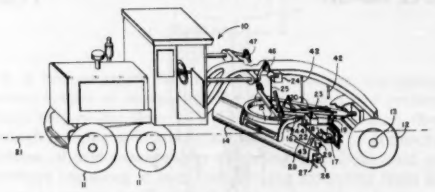
through said annular chamber to at least a value equal to the cross-section flow area of the central opening of the lower portion of said sliding sleeve section and ball means engageable in said ball seat to close off flow through the central opening in said sliding sleeve and for disconnecting said sliding sleeve section from said skirt section to permit said sliding sleeve section to be depressed to the down position to open said annular chamber to flow from said skirt section whereby steam is directed out of said annular chamber into the well in a direction substantially concentric with and parallel to the longitudinal axis of said tubing string.

4,081,033

SLOPE CONTROL SYSTEM

Frederick J. Bulger, West Dundee, Ill.; Royal R. Hawkins, Bloomington, Minn., and Leland E. Kuntz, Arlington Heights, Ill., assignors to Honeywell Inc., Minneapolis, Minn.

Continuation of Ser. No. 408,778, Oct. 23, 1973, abandoned.
This application Jan. 11, 1977, Ser. No. 758,522
Int. Cl.[2] E02F *3/76*
U.S. Cl. 172—4.5 **3 Claims**



1. A slope control for the working tool of an earth working machine, said earth working machine having a machine frame, an adjustable means for controlling the orientation of the working tool, and a longitudinal axis, said control comprising:

slope sensor means for sensing the slope of said working tool;

means for suspending said slope sensor means from said machine for allowing said slope sensor means to move only vertically in the roll direction;

support means having one end for supporting said slope sensor means for controlling movement of said slope sensor means in said roll direction and having a second end, said support means adapted to move along with said working tool in roll and pitch directions;

linkage means for connecting said second end of said support means to said working tool to rotate said first end of said support means as said working tool rotates; and,

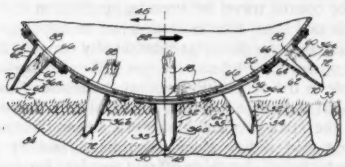
control means responsive to said slope sensor means for controlling the slope of said working tool.

4,081,034

SOIL AERATING DEVICE

Charles E. Hines, Lincoln, Nebr., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Feb. 28, 1977, Ser. No. 772,531
Int. Cl.[2] A01B *45/02*
U.S. Cl. 172—22 **16 Claims**



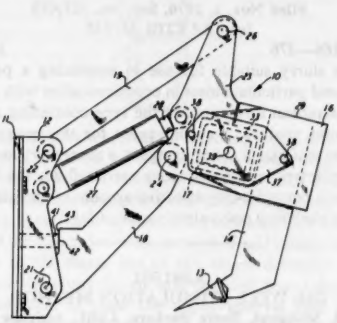
1. A soil aerating device comprising a hollow cylindrical drum supported for rotation about a horizontally extending axis and for rolling travel along the surface of the ground or turf to be aerated, said drum having an outer wall including a plurality of circumferentially spaced apertures, and a plurality of core-forming tines fixedly mounted on the exterior of said drum and extending radially outwardly therefrom, each of said tines including a pair of generally V-shaped opposed side walls extending generally parallel to the direction of travel and having an apex located on or near a radial plane extending radially from the drum axis, each of said side walls having a trailing end portion and a leading end portion having, adjacent said apex, a first part which terminates in a cutting edge segment, and a transverse trailing end wall connecting said trailing end portions of said side walls and cooperating with said side walls to define a hollow interior communicating with a respective one of said drum apertures, said trailing end wall having a radially outermost end portion terminating in a cutting edge segment which cooperates with said side wall cutting edge segments to form a generally U-shaped cutting edge having a bight located adjacent said side wall apexes.

4,081,035

TRACTOR WITH RIPPER ATTACHMENT HAVING A COMBINED TOOL BAR AND COUNTERWEIGHT CONTAINER

Victor Ross Bowen, Bettendorf, Iowa, assignor to J. I. Case Company, Racine, Wis.

Filed Jan. 31, 1977, Ser. No. 764,365
Int. Cl.[2] A01B *35/14*
U.S. Cl. 172—484 **1 Claim**



1. A tractor with ripper attachment having a combined tool bar and counterweight container, comprising a tractor, a ripper attachment assembly removably and pivotally connected to the rear of said tractor for up and down pivotal movement on said tractor, said assembly including a horizontally disposed tool bar and rippers connected to said tool bar and mounting links and a powered cylinder assembly interconnected between said tool bar and said tractor for the up and down pivotal movement of said assembly on said tractor, said links being disposed to present a parallelogram arrangement for the up and down movement of said assembly, said powered cylinder being of a limited contracted length and disposed for moving said assembly upwardly, an abutment on said tractor and extending to said links and abuttable with said links for limiting the upward ripper attachment assembly movement and with said abutment being positioned to engage said links when said cylinder assembly is at least near its limited retracted position, said tool bar being an elongated hollow bar having an endless girth extending along the plane transverse to the longitudinal axis of said tool bar and for the full length of said tool bar and defining the hollow interior of said tool bar which is free of any protrusions in said hollow interior, a counterweight removably disposed in said tool bar for counterbalancing the weight of said tractor and for urging said assembly downwardly, said counterweight having a cross-sectional shape similar to that of

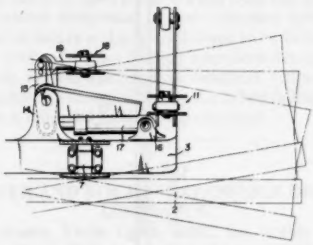
said hollow interior of said tool bar, for sliding of said counterweight into said hollow interior and for snug fitting of said counterweight in said tool bar, plates extending around the opposite ends of said tool bar and beyond said girth of said tool bar transverse to the length of said tool bar, covers removably bolted to said plates and extending over the openings in the opposite ends of said tool bar for enclosing said counterweight therein, said covers each having an opening therein for inspecting the interior of said tool bar when said covers are attached thereto, and ripper mounting members attached to said tool bar and extending transversely thereof on the exterior of said tool bar for attachment of said rippers relative to said tool bar and free of extendingthrough the hollow interior of said tool bar.

4,081,036

MOUNTING ARRANGEMENT FOR SUPPORTING BULLDOZER BLADE

Masao Yokoyama, Komatsu, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Jul. 20, 1976, Ser. No. 707,043
Int. Cl.² E02F 3/76
U.S. Cl. 172—804 **2 Claims**



1. A mounting apparatus for supporting a bulldozer blade on a vehicle said apparatus comprising

(a) a mounting frame having side members with one end pivotally connected to said vehicle and extending therefrom and an intermediate member connectible between the other ends of said side members;

(b) a universal joint for connecting a central portion of said blade to said intermediate member;

(c) a pair of hydraulic jacks for angling said blade, each said jack having one end pivotally connected to said mounting frame and the other end connectible to a side of said blade;

(d) means for operating said pair of hydraulic jacks in opposition to each other for adjusting the angle of said blade;

(e) a rocker arm pivotally mounted to said intermediate portion wherein said intermediate member includes a bracket, said bracket being pivotally connected to said rocker arm at a location centrally between one end and the other end of said rocker arm;

(f) a tilting jack connected and extending therebetween to said mounting frame and the one end of said rocker arm; and

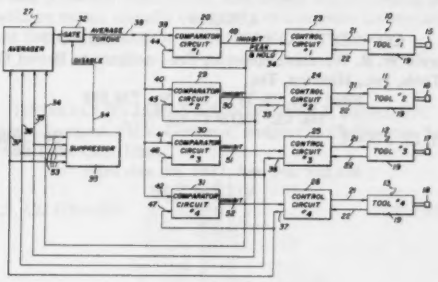
(g) a connecting rod connected to the other end of said rocker arm and connectible to said blade and extending therebetween when connected, wherein said tilting jack tilts said rocker arm and thereby tilts said blade when connected about the longitudinal axis of said universal joint.

4,081,037

CONTROL SYSTEM FOR A MULTIPLE SPINDLE MACHINE

Gregg N. Jonsson, Batavia, Ill., assignor to Thor Power Tool Company, Aurora, Ill.

Filed Feb. 2, 1976, Ser. No. 654,545
Int. Cl.² B25B 23/14
U.S. Cl. 173—1 **31 Claims**



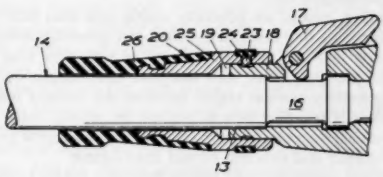
1. A central control circuit for use in a machine having a plurality of torque applying units, comprising comparator means responsive to the torque output of each of said units and responsive to a torque comparison value, said comparison value being a function of the instantaneous torque output of at least one of said units and increasing as said instantaneous torque output increases, said comparator means comparing said torque output of each unit with said comparison value and preventing operation of a unit having a torque output which is greater than said torque comparison value.

4,081,038

HAND HELD IMPACT DEVICE

Sture R. Andersson, Saltsjo-Duvnas; Jarl J. Blomberg, Nacka, and Heino Elmessaar, Lidingo, all of Sweden, assignors to Atlas Copco Aktiebolag, Nacka, Sweden

Filed Apr. 14, 1976, Ser. No. 676,750
Claims priority, application Sweden, Apr. 22, 1975, 046276
Int. Cl.² E21B 3/00
U.S. Cl. 173—162 **11 Claims**



1. A hand held impact device comprising:

a housing having an impact mechanism located therein, a front opening for receiving the shank of a working tool, and a working tool retaining means,

a sleeve shaped maneuver handle for receiving the working tool shank therethrough for manual guidance of the working tool, said sleeve shaped maneuver handle having an internal diameter at least as large as the diameter of said tool shank opening of said housing and larger than the diameter of the working tool shank passing therethrough, and being freely manually displaceable along the shank of the working tool during working, and

releasable coupling means selectively coupling said maneuver handle to said housing such that said housing releasably supports said maneuver handle in coaxial relationship with said tool shank opening with said tool shank passing through said sleeve shaped maneuver handle,

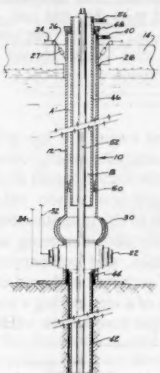
said sleeve shaped maneuver handle comprising a flexible portion extending ahead of said releasable coupling means in the working direction and which is manually compressible into contact with the working took shank, said flexible portion comprising at least one vibration insulating element for insulating an operator from vibrations of the working tool.

4,081,039

CONNECTING ASSEMBLY AND METHOD

Harold W. R. Wardlaw, Houston, Tex., assignor to Brown Oil Tools, Inc., Houston, Tex.

Filed Oct. 28, 1976, Ser. No. 736,396
Int. Cl.[2] E21B *15/02, 7/12*
U.S. Cl. 175—7 **34 Claims**



1. A riser assembly for connecting a marine well operating facility with a well site which is submerged in water comprising:

(a) riser tube means having a first end flexibly joined to said operating facility and a second end flexibly joined to said submerged site;

(b) liner means, set generally within said riser tube means, having a first end and a second end generally toward said first end and said second end of said riser tube means respectively, and, with said riser tube means, defining a generally annular region between the radially inner surface of said riser tube means and the radially outer surface of said liner means with a first end of said region generally toward said first end of said liner means;

(c) seal means for fluid sealing said liner means to said riser tube means generally toward said second end of said liner means, thereby defining a second end of said generally annular region; and

(d) gas input means for selectively introducing gas into said generally annular region for generally increasing the buoyancy of said riser assembly by decreasing the density or the amount, or both, of liquid in said region.

4,081,040

METHOD AND APPARATUS FOR THIN-WALLED TUBE SAMPLING OF SOILS

William P. Henson, Indianapolis, Ind., assignor to Mobile Drilling Company, Inc., Indianapolis, Ind.

Filed May 6, 1977, Ser. No. 794,530
Int. Cl.[2] E21B *49/02, 23/02*
U.S. Cl. 175—58 **6 Claims**

1. An earth sampling apparatus which comprises:

a drilling apparatus having rotary power means;

an auger section including a hollow tube with a helical flight secured thereto;

a hollow-centered drive shaft connected to said drilling apparatus;

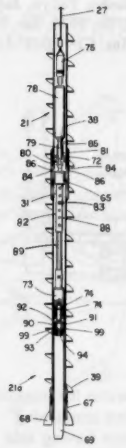
a hollow-centered coupling connecting the drive shaft to the auger section;

a sampling device including a locking element bearingly connected to a thin-walled sampling tube in such a manner that as the locking element is rotated, the thin-walled sampling tube remains stationary;

reelable cable means connected between the drilling apparatus and the locking element of said sampling device and operable to move the sampling device through said hollow tube; and

a latching mechanism on said locking element and hollow tube for rigidly securing the locking element of said sampling device to the hollow tube whereby downwardly-advancing rotation of said hollow tube produces downwardly-advancing motion of said thin-walled sampling tube.

4. A method of core sampling comprising the steps of:



positioning a drilling apparatus having a rotary power means and a hollow driver connected thereto at a drilling site;

connecting a hollow-stem auger to the hollow driver by means of a hollow-centered coupling;

attaching a pilot bit plug to said hollow-stem auger;

operating said drilling apparatus and power means to rotate and advance said hollow-stem auger and cause said auger to drill a hole into the earth to a desired sampling depth;

removing said pilot bit plug from the hollow-stem auger;

inserting a sampling device through the hollow driver, hollow-centered coupling and auger to the bottom of the hole by means of a reelable cable;

locking the sampling device into the auger so that the sampling device extends beyond the lower end of said auger;

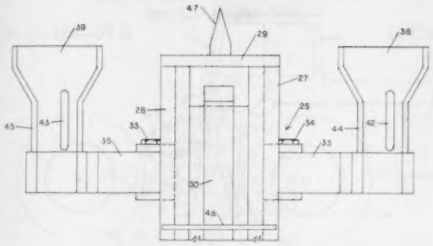
rotating the auger around the sampling device while moving the auger and sampling device downwardly to take a sample; and

retrieving said sampling device with the soil sample therein from the bottom of the hole by means of said reelable cable.

4,081,041
DUST-COLLECTING HEAD

Michael J. Perri, and Glen A. Zumwalt, both of Green River, Wyo., assignors to Stauffer Chemical Company of Wyoming, San Francisco, Calif.

Filed Feb. 22, 1977, Ser. No. 770,737
Int. Cl.² E21C *7/00*
U.S. Cl. 175—209 **4 Claims**

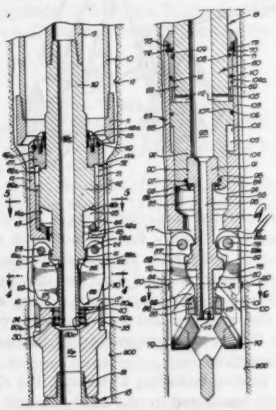


1. In a roof drilling machine provided with a rotatable chuck adapted to receive a drill rod for drilling a hole into the roof of a mine and consisting of a pair of spaced-apart frame members having a chain connected to the chuck between said frame members and rotatable to move the rotating chuck upwardly during drilling operations; a dust-collecting system pivotally mounted adjacent the upper end of said spaced-apart supporting mechanism rotatable to the closed position around the drilling rod and to an open position away from the drilling rod; the improvement comprising a dust-collection system being symmetrical in nature and a conical shape to be fully enclosed around the drill rod during drilling operations and an opening on each side of said symmetrical members connected to a separate source of vacuum whereby the debris falling from the drilling site is removed through the openings.

4,081,042
STABILIZER AND ROTARY EXPANSIBLE DRILL BIT APPARATUS

Gary R. Johnson, Yorba Linda, Calif., and Archer W. Kammerer, Jr., Tryon, N.C., assignors to Tri-State Oil Tool Industries, Inc., Bossier City, La.

Filed Jul. 8, 1976, Ser. No. 703,525
Int. Cl.² E21B *9/26*
U.S. Cl. 175—267 **20 Claims**

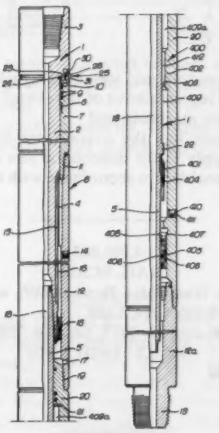


1. A stabilized rotary well drilling bit apparatus; comprising rotatable body means connectable to a drilling string, initially retracted, outwardly expandable cutter means mounted on said body means for rotation therewith and for enlarging the diameter of a bore hole to a predetermined extent, initially retracted outwardly expandable stabilizer means trailing said cutter means and mounted on said body means for rotation therewith together with said cutter means, means for effecting joint rotation of said body means, cutter means and stabilizer means during drilling of the enlarged bore hole, means for expanding said cutter means laterally outwardly to enlarge the bore hole to said predetermined extent, and means for expanding said stabilizer means laterally outwardly to a position closely adjacent the wall of the enlarged bore hole.

4,081,043
HYDRAULIC JARS FOR BORE HOLE DRILLING

Rainer Juergens, Celle, Germany, assignor to Christensen, Inc., Salt Lake City, Utah

Filed Jan. 26, 1977, Ser. No. 762,624
Int. Cl.² E21B *1/10*
U.S. Cl. 175—297 **14 Claims**



1. Hydraulic hammer jars for deep well drilling, which can be installed as a component in the drilling string; an outer pipe body and an inner pipe body within said outer body and defining therewith an annular space adapted to be filled with a pressure medium, said outer pipe body and said inner pipe body being telescopically related to each other and extensible and contractable axially with respect to each other, an inner percussion piston on one of said bodies acting as a hammer, an anvil on the other of said bodies adapted to be struck by said hammer upon separating movement between said bodies, and a releasable locking device operatively associated with said bodies to limit relative axial separating movement between said bodies, said locking device including means released in response to a predetermined axial pull being taken on said inner and outer pipe bodies.

4,081,044
FEED CONTROL SYSTEM FOR MULTIPLE PACKAGING MACHINES

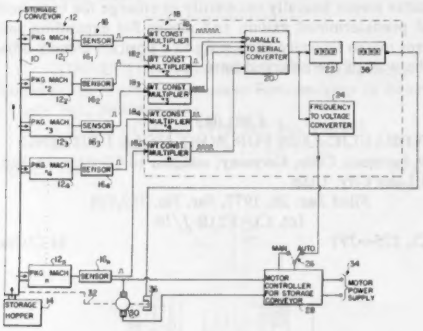
Kenneth Martin Allen, Box 352, Newberg, Oreg. 97132

Filed May 10, 1977, Ser. No. 795,498
Int. Cl.² G01G *13/00, 13/04;* **B67D** *5/08*
U.S. Cl. 177—103 **10 Claims**

1. A feed control system for multiple packaging machines located at different stations along a distribution line and fed from a common supply, said control system comprising:

means, individual to the packaging machines, for producing an output signal in response to the associated packaging machine completing a packaging cycle;

means, connected to the outputs of said output signal producing means, for individually weighting the output signals produced by said output signal producing means so as to produce weighted signals corresponding to the weight constants of the packages produced by the individual packaging machines;



means for converting said weighted signals into a total demand signal representative of the overall demand of all of the packaging machines; and

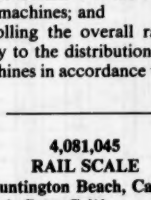
means for controlling the overall rate of feed from said common supply to the distribution line and hence to the packaging machines in accordance with said total demand signal.

4,081,045

RAIL SCALE

Raymond Harris, Huntington Beach, Calif., assignor to United S. C. F., Inc., South Gate, Calif.

Filed Jan. 10, 1977, Ser. No. 758,138
Int. Cl.[2] G01G *19/06*
U.S. Cl. 177—163 **4 Claims**



1. An improved rail scale having a live rail and at least two weight measuring means adapted to be fixedly connected to a rail support system, said improvement comprising a single unitary U-shaped rail hanger having a length that is substantially co-extensive with the length of the live rail, said U-shaped rail hanger having a first leg adapted for connection to the live rail, a second leg adapted for connection to the weight measuring means, and a vertical member connecting said legs and parallel to the live rail.

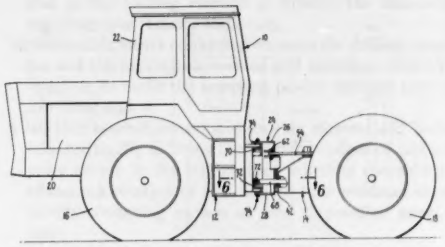
4,081,046

DRIVE TRAIN SUPPORT FOR AN ARTICULATED VEHICLE

Lawrence J. Stone, Livonia, Mich., assignor to Massey-Ferguson Inc., Detroit, Mich.

Filed Oct. 27, 1976, Ser. No. 735,868
Int. Cl.[2] B60D *1/02*
U.S. Cl. 180—14 B **13 Claims**

1. An articulated vehicle comprising; a forward frame and a rearward frame, a hinge frame between said forward and rearward frames, said frames being connected to each other for steering movement about a generally vertical axis and for relative twisting movement about a generally horizontal axis, a power plant mounted on said forward frame, a driven member mounted on said rearward frame, a drive train between said power plant and said driven member, said drive train including a driven shaft having a universal connection to said driven member, a drive shaft having a forward universal connection



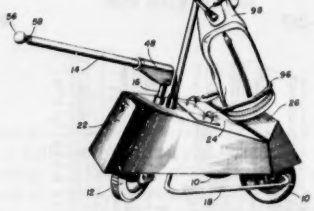
to said power plant, an intermediate universal connection between said drive shaft and driven shaft, a mounting member having spaced portions pivotally connected to said hinge frame and to said rearward frame, respectively, and means supporting said driven shaft on said mounting member for movement in a path maintaining said driven shaft and vertical axis in a common plane during steering and twisting movement of said frames relative to each other.

4,081,047

MOTORIZED CART

Walter Lovell, 348 Mountain Rd., and Richard Lawrence, 39 Manchonis Rd., both of Wilbraham, Mass. 01095

Filed Mar. 9, 1976, Ser. No. 665,233
Int. Cl.[2] B62D *51/04*
U.S. Cl. 180—19 H **1 Claim**



1. A power operated cart comprising a wheeled frame, an electric motor and a battery for the motor on said frame, a motor control, a swingable elongated handle, means for mounting said handle, a hand grip on said handle, means mounting said hand grip for longitudinal motion, and a connection between the hand grip and the motor control for varying the power to the motor upon motion of the hand grip in a longitudinal direction,

said motor control including a rheostat, the rheostat being operatively connected to said hand grip and comprising a series of turns of wire and a contact movable with the hand grip along said turns of wire, a fixed contact extending along a certain number of turns and forming means for by-passing the rheostat and providing full power direct

from the battery to the motor when said hand grip is extended to its furthermost position,

and an electric power circuit wherein the rheostat and fixed contact control the motor.

4,081,048

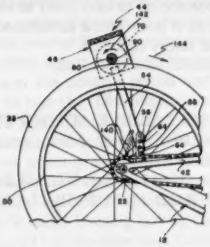
AUTOMATIC TORQUE SENSOR

William E. Hendricks, 1305 Arrowhead, Wichita, Kans. 67203

Filed Jul. 25, 1975, Ser. No. 599,179

Int. Cl.[2] B62M *7/08*

U.S. Cl. 180—33 D **14 Claims**



1. In a frictional drive system of the type wherein a wheel is mounted for rotation about its axis and wherein a driving member is provided that has a movable endless peripheral part that travels a closed planar track that is external to and coplanar with the wheel, and wherein a portion of the peripheral part of the driving member bears with force against and is in frictional engagement with an external peripheral portion of the wheel whereby movement of the driving member peripheral portion in one direction frictionally urges movement of the wheel peripheral portion in such one direction, the improvement comprising means for automatically varying the bearing force in response to variations in the magnitude of reactive force experienced by the driving member in frictionally urging rotation of the wheel, said means comprising the provision of means for mounting the driving member for pivotal movement about a pivot axis that is parallel to the wheel axis and spaced from the latter an interval less than the radius of the wheel, whereby the driving member can move toward and away from the wheel along a path that is angularly intermediate the directions of the bearing and frictional forces, whereby the bearing force can be minimized as it tends to vary in a manner sufficient to sustain essentially non-sliding frictional engagement of the driving member with the wheel and wherein the position of frictional engagement is spaced from the pivot axis a distance at least as great as the radius of the wheel.

4,081,049

STEERABLE FRONT WHEEL DRIVE UNIT

Donald W. Youmans, San Jose, Calif., assignor to FMC Corporation, San Jose, Calif.

Continuation of Ser. No. 683,132, May 4, 1976, abandoned. This application Mar. 3, 1977, Ser. No. 774,002

Int. Cl.[2] B60K *17/30*

U.S. Cl. 180—43 C **14 Claims**

1. In a motor vehicle having a wheel-steering arrangement and a motor-driven differential gear mounted on the frame of said vehicle, a steerable power-driven wheel combination comprising:

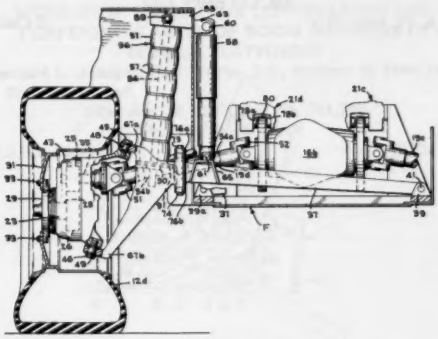
a gear-reduction unit having an input shaft and an output shaft, said input shaft being located above said output shaft;

means for mounting said wheel on said output shaft of said unit so that said unit is mounted directly adjacent to said wheel;

a rigid control arm extending transversely of said vehicle;

means for connecting one end of said control arm to said frame of said vehicle for pivotal movement about an axis extending longitudinally of said vehicle;

means for pivotally connecting said gear-reduction unit to the other end of said control arm so that said wheel can pivot about a generally vertical axis;



spring support means connected between said control arm and said frame of said vehicle and extending above said control arm; and

flexible drive means connected between said differential gear and said input shaft of said gear-reduction unit.

4,081,050

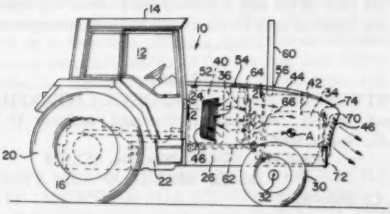
FRONT ENGINE TRACTOR HAVING TRANSVERSE MIDSHIP MOUNTED HEAT EXCHANGER

Richard G. Hennessey, Oak Lawn; Richard A. Hale, Downers Grove, and Anthony M. Kestian, Berwyn, all of Ill., assignors to International Harvester Company, Chicago, Ill.

Filed Feb. 2, 1977, Ser. No. 765,162

Int. Cl.[2] B60K *5/02, 11/04*

U.S. Cl. 180—64 R **12 Claims**



1. In a tractor vehicle having a steerable front axle supporting the vehicle frame, the improvement comprising:

an engine mounted on the frame whereby the center of gravity of said engine is forward of said steerable front axle;

a fuel tank carried midships of the vehicle;

an engine coolant heat exchanger mounted in the vehicle between said engine and said fuel tank having fluid transfer means allowing fluid communication between said engine and said heat exchanger;

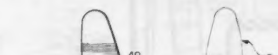
an engine driven fan mounted between said engine and said engine coolant heat exchanger whereby a flow of air drawn by said engine driven fan from the fuel tank side of said heat exchanger passes through said engine coolant heat exchanger and past said engine.

4,081,051

ADJUSTABLE SUPPORT FOR REVERSIBLE SEAT OF A DUAL-PURPOSE VEHICLE

John S. Logsdon, Chillicothe, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Dec. 27, 1976, Ser. No. 754,295
Int. Cl.² B60N *1/02*
U.S. Cl. 180—77 S **5 Claims**



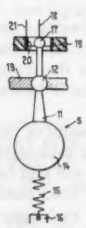
1. In a reversible and adjustable seat apparatus for an operator's station of a dual-purpose vehicle having a first implement at the front and a backhoe at the rear with backhoe controls which are higher above the vehicle platform than are the first implement controls, said seat apparatus including a seat and a back mounted for movement between positions at opposite transverse margins of the seat, an adjustable support on which said seat is carried comprising, in combination:
- a pair of laterally spaced, elongated mounting brackets on the vehicle platform;
- tracks on said mounting brackets toward the front of the operator's station;
- pivot supports on said mounting brackets toward the rear of the operator's station;
- a carriage on which the seat is mounted;
- rollers mounting the front of said carriage in said tracks;
- a pair of supporting links pivotally mounting the rear of said carriage on said pivot supports;
- and operating means including a lever operatively connected to the carriage for simultaneously elevating the rear of the carriage and moving the carriage rearwardly by pivoting it and said supporting links, whereby when the back of the seat is toward the front of the vehicle the seat position may be improved for backhoe operation.

4,081,052

SAFETY SEAT BELT LOCKING DEVICE FOR VEHICLES

Samuel Schärer, Solothurn, Switzerland, assignor to BEGA A.G., Switzerland

Filed Feb. 13, 1976, Ser. No. 657,930
Int. Cl.² B60R *21/10*
U.S. Cl. 180—82 C **10 Claims**



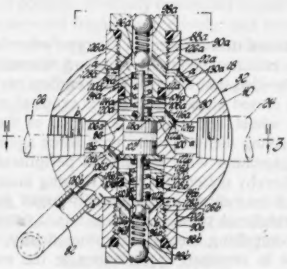
1. A safety seat belt locking device for vehicles having an electrical primary ignition circuit, said locking device comprising:
- a locking lever for retaining said seat belt in a locked position;
- a solenoid device connected to said locking lever and energized when the ignition is turned on for maintaining said locking lever in its seat belt retaining position;
- a relay connected to said solenoid and having an adjustable time delay;
- a switch responsive to an impact to said vehicle from substantially any direction for energizing said relay and deenergizing said solenoid device so as to disengage said locking lever from its seat belt retaining position and unlock said safety seat belt; and
- a security switch connected to said relay in such a way that the primary circuit is interrupted simultaneously with the unlocking of said safety seat belt.

4,081,053

LOCK VALVE FOR DOUBLE ACTING CYLINDER

Clarence A. Sherman, Birmingham, Mich., assignor to Terry McDermid, Southfield, Mich.

Filed Nov. 19, 1976, Ser. No. 743,269
Int. Cl.² B62D *33/06*; F15B *13/042*
U.S. Cl. 180—89.15 **3 Claims**



1. In a tilting cab control system for moving a tilting cab on an associated vehicle frame between use and access positions, a control cylinder of the double acting type comprising: an elongated housing defining a cylinder bore and having ends on opposite sides of the bore; a power piston sealingly slidable in the bore and having a connecting rod extending outwardly from the housing through one end thereof; said piston dividing the bore into pull and push chambers such that pressurized control fluid respectively provided thereto slides the piston with the bore to extend and retract the connecting rod and to thereby raise and lower the tilting cab with the cylinder connected between the cab and the associated vehicle frame; said other housing end including a lock valve housing portion having a round cross-section along the direction of power piston movement and defining the first and second fluid paths for respectively providing pressurized control fluid to the push and pull bore chambers; first and second check valves mounted on the lock valve housing portion spaced from each along a first axis perpendicular to the direction of power piston movement and respectively disposed along the first and second fluid paths; said check valves having respective openings aligned with each other along said first axis and also having respective valve elements for closing the valve openings from the opposite side thereof as the other check valve; each check valve including a biasing spring that biases the valve element thereof to a closed position preventing reverse fluid flow from the associated bore chamber through the valve opening thereof; a bore in the lock valve housing portion between the check valves in alignment with the openings thereof along said first axis; a control piston sealingly slidable within the lock valve housing portion bore along said first axis and having first and second actuating projections for respectively moving the check valve elements upon control piston movement in opposite directions to open the check valves against the action of

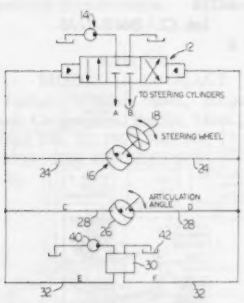
the biasing springs thereof; said control piston having first and second sides facing in opposite directions respectively toward the first and second check valves; said first side of the control piston being in fluid communication with the first fluid path such that pressurized control fluid supplied thereto upstream from the first check valve flows downstream therethrough to the cylinder push chamber and concomitantly moves the control piston to open the second check valve to permit reverse fluid flow therethrough from the cylinder pull chamber; said second side of the control piston being in fluid communication with the second fluid path such that pressurized control fluid supplied thereto upstream from the second check valve flows downstream therethrough to the cylinder pull chamber and concomitantly moves the control piston to open the first check valve to permit reverse fluid flow therethrough from the cylinder push chamber; a pair of helical biasing springs respectively located between the control piston and the first and second check valves to bias the control piston along the first axis to a center position where the actuating projections thereof permit the valve elements of each check valve to remain in closed position except when pressurized control fluid is supplied to one of the fluid paths upstream from its check valve to act against the bias of the helical spring on the opposite side of the piston; said lock valve housing having first and second conduit openings disposed on opposite sides thereof along a second axis perpendicular to the first axis and to the direction of power piston movement; the lock valve housing portion including an axial bore parallel to the direction of power piston movement and communicating the downstream side of the first check valve and the cylinder push chamber; and the cylinder also including a conduit communicating the downstream side of the second check valve and the cylinder pull chamber.

4,081,054

HYDRAULIC STEERING WITH FEEDBACK

Jan B. Yates, Reynoldsburg, Ohio, assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Apr. 7, 1977, Ser. No. 785,621
Int. Cl.[2] B62D *5/06*
U.S. Cl. 180—139 **8 Claims**



1. In a hydraulic steering system for an articulated vehicle which comprises main steering valve means which directs fluid introduced thereto from fluid source means to steering motor means responsive to an output of steering pump means, an improvement comprising:

articulation angle responsive pump means;

articulation conduit means connecting said articulation angle pump means in parallel to said steering pump means to make steering valve means responsive to a difference in flow between said steering pump means and said articulation angle pump means;

hydraulic accelerometer means for detecting lateral acceleration of the vehicle; and

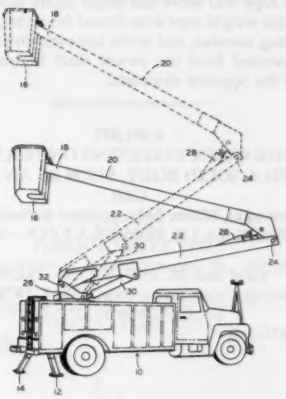
accelerometer conduit means connecting said hydraulic accelerometer means in parallel to said steering pump means and said articulation pump means to make said steering valve means responsive to a difference in flow between said steering pump means and said articulation angle pump means plus a signal determined by said hydraulic acceleromater means.

4,081,055

HYDRAULIC DEVICE FOR CONTROLLING THE PERPENDICULARITY OF BOOM MEMBERS IN MOBILE PLATFORMS

Leonard L. Johnson, Fort Wayne, Ind., assignor to Teco, Inc., Fort Wayne, Ind.

Filed Jan. 24, 1977, Ser. No. 761,730
Int. Cl.[2] B66F *11/04*
U.S. Cl. 182—2 **6 Claims**



1. In a mobile lift platform having a pair of articulated booms, a first rotary member at the base of the first of said booms, a second rotary member associated with the free end of the upper articulated boom, elongated flexible means for positively interconnecting the two said rotary members whereby the upper rotary member by its angular position is calibrated in terms of the upper boom location relative to the horizon, actuator means operatively connected to said means interconnecting said upper and lower rotary members, valve means responsive to said actuator means and adapted to effect the discontinuance of movement of either the upper or lower booms in a direction effecting upper boom angularity approaching perpendicularity to the horizon, and power means for effecting independent movement of the upper and lower booms respectively and responsive to said valve.

4,081,056

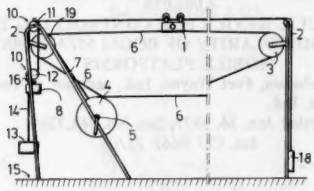
DRIVE MEANS FOR MOVING A TARGET FIGURE INTENDED FOR SPORTS SHOOTING

Anssi Pekka Siitonen, Lentokonetehtaantie 3 C 24, 33900 Tampere 90, Finland

Filed Jul. 26, 1976, Ser. No. 708,348
Int. Cl.[2] F03G *3/00*
U.S. Cl. 185—6 **6 Claims**

1. Drive means for moving a target figure intended for sports shooting which comprises: a frame; a pulley and a power wheel mounted on support of the frame; a power shaft connected to the power wheel; an endless pulling rope passing around the pulley and the power wheel having the figure affixed thereto; a weight rope; a moving weight connected to the power shaft by the aid of the weight rope, said moving weight being suspendable from the weight rope wound around the power shaft enabling gravity to act on the moving weight and move the figure by cooperative action of the weight rope, the power shaft and the power wheel, and of the pulling rope; a holding member disposed on said power shaft for winding

the weight rope around the power shaft in one direction and, being adapted to change the direction of winding of the weight rope in the opposite direction by action on said rope by said holding member, whereby the moving weight suspended from



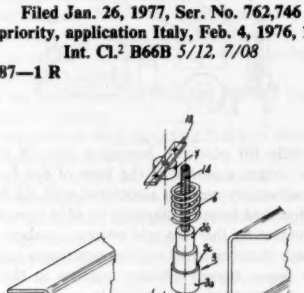
the weight rope will move the target figure first in one direction while the weight rope is unwound from the power shaft up to the holding member, and in the opposite direction while the rope is unwound from the power shaft beyond the holding member in the opposite direction.

4,081,057

DEVICE FOR QUICK FASTENING ONE OR MORE WIRE ROPES TO A SOLID BODY, SUCH AS AN ELEVATOR CAR

Corrado Corradini, Milan, Italy, assignor to Societa ' Ascensori Italiani Riuniti-S.A.I.R. Falconi-S.A.F.O.V. - S.p.A., Novara, Italy

Filed Jan. 26, 1977, Ser. No. 762,746
Claims priority, application Italy, Feb. 4, 1976, 19882 A/76
Int. Cl.[2] B66B *5/12, 7/08*
U.S. Cl. 187—1 R **4 Claims**



1. A device for fastening an end of a wire rope to a body, the end having attached thereto a stepped member whose diameter increases in a direction away from the rope from a first diameter larger than that of the wire rope to a second diameter larger than said first diameter, the device comprising a fastening plate integral with the body and having an opening defined therein, the opening having an insertion portion with a diameter at least as large as the second diameter of said member, a fastening portion with a diameter at least equal to the first diameter of said member and less than the second diameter of said member, and a connecting portion connecting said insertion and fastening portions and having a width at least as large as the diameter of the rope and less than the first diameter of said member.

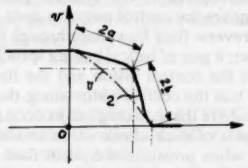
4,081,058

CONTROL APPARATUS

Jean Duriez, 119, rue J. Gielee a Lille (59), and Jean Evin, Hameau de la Becque a Avelin (59), both of France

Filed Nov. 17, 1975, Ser. No. 632,845
Int. Cl.[2] B66B *1/30*
U.S. Cl. 187—29 R **5 Claims**

1. Control apparatus for regulation of the deceleration of an elevator up to full stop, in a variable time but over a constant distance whatever the inertia, acceleration and initial speed of the elevator which, upon arrival at a given distance from the stopping point, receives a signal to begin slowing down, comprising a comparator for two current functions, one for the actual decrease of speed and the other for the desired decrease of speed imposed by the consignor means controlled by the differential current from the comparator for determining the variation of the speed of the elevator, the consignor being connected to means causing a decrease of the current that it elaborates as a function of the available distance and not of



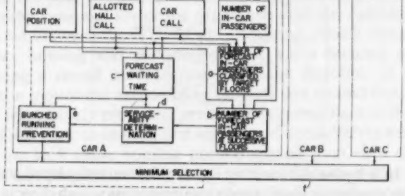
time consisting of at least one counter of the distance covered from the beginning of the decrease of speed, a reader providing impulses to the counter which are responsive to the passage of crests of a member whose movement is synchronized with the actual movement of the elevator, the number of impulses being proportional to the distance covered the improvement comprising a frequency discriminator elaborating the variable voltage representing the variation of the actual speed of the elevator connected downstream of the reader transmitting frequency impulses proportional to the speed of the elevator.

4,081,059

ELEVATOR CONTROL SYSTEM

Soshiro Kuzunuki; Kotaro Hirasawa, both of Hitachi; Tatsuo Iwasaka, and Takashi Kaneko, both of Katsuta, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Oct. 5, 1976, Ser. No. 730,261
Claims priority, application Japan, Oct. 11, 1975, 50-121837; Apr. 18, 1976, 51-44314
Int. Cl.[2] B66B *1/18*
U.S. Cl. 187—29 R **26 Claims**



1. An elevator control system for controlling a plurality of elevator cars arranged for parallel operation for servicing a plurality of floors of a building, comprising hall call registering means disposed at each floor, car call registering means disposed in each said elevator car for instructing target floors, means for selecting a suitable one of said elevator cars in response to the origination of a new hall call from one of the floors, and means for allotting this new hall call to said selected elevator car so that said selected elevator car can service this new hall call, wherein the improvement comprises means for detecting for each said elevator car the number of already instructed stopping floors within a predetermined floor range covering a plurality of backward or forward floors contiguous

to said new hall call originating floor, and means for preferentially allotting the new hall call to one of said elevator cars having said already instructed stopping floors within said predetermined floor range.

4,081,060

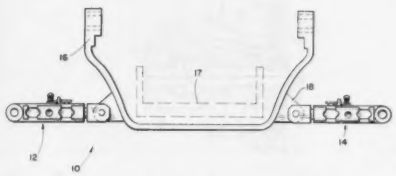
BRAKE ADJUSTMENT DEVICE FOR CONVERTING DOUBLE SHOE CLASP-TYPE BRAKE ASSEMBLY TO SINGLE SHOE BRAKE ASSEMBLY

Roy H. Touchstone, P.O. Box 2003, Jackson, Tenn. 38301

Continuation of Ser. No. 661,421, Feb. 26, 1976, abandoned. This application Dec. 20, 1976, Ser. No. 752,540

Int. Cl.[2] F16D 65/44

U.S. Cl. 188—197 **3 Claims**



1. In combination with a locomotive braking apparatus converted from a double shoe clasp-type assembly to a single brake shoe assembly and having safety strap means therefor, the improvement comprising a slack adjuster device operably connected between the safety strap means and the converted braking apparatus and comprising a pair of substantially triangular bracket plate members rigidly secured to the opposite ends of the safety strap means and extending outwardly therefrom in opposite directions, elongated slide bar means pivotally secured to each bracket member and extending outwardly therefrom, trunnion means pivotally secured to the converted braking apparatus and having one open end for receiving a slide bar means therein, one of said trunnion means being slidably disposed on each of said slide bar means, and keeper pin means cooperating between the slide bar means and trunnion means for locking thereof in substantially any preselected longitudinal position therebetween.

4,081,061

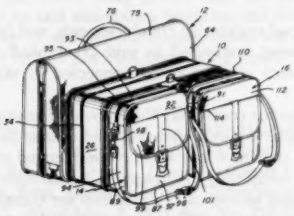
MODULAR LUGGAGE

Deborah E. Tucker, Boston, Mass., assignor to Harrison Leather Goods Corporation, Boston, Mass.

Filed Feb. 22, 1977, Ser. No. 770,291

Int. Cl.[2] A45C 5/06

U.S. Cl. 190—52 **26 Claims**



1. Modular hand luggage including a plurality of luggage pieces each capable of independent use and capable of being secured together when desired for shipping and carrying comprising,

a generally rectangular first luggage piece having a pair of parallel side panels, bottom wall, a top and two ends,

generally rectangular second and third luggage pieces each having a pair of parallel side panels and each capable independently of any other luggage piece of functioning as a piece of luggage for carrying clothing or other articles,

one side panel of each of the second and third luggage pieces together being approximately equal to the size of the side panel of the first luggage piece so that when the second and third pieces are arranged side by side with their side panels coplanar their combined height and width dimensions approximately are the same as the height and width dimensions of the side panels of the first piece, and

fastening means secured to at least one of the side panels of each of the three luggage pieces for releasably securing the second and third pieces side by side to a side panel of the first piece,

said fastening means being capable of securing the second and third luggage pieces together in face to face relationship independent of the first luggage piece.

4,081,062

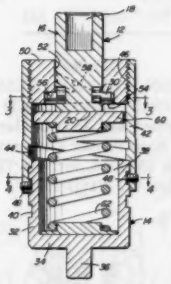
TORQUE DRIVE UNIT

James P. Kappernaros, 1623 Villanova St., Pittsburgh, Pa. 15206

Filed Oct. 22, 1976, Ser. No. 735,065

Int. Cl.[2] F16D 7/00

U.S. Cl. 192—56 R **9 Claims**

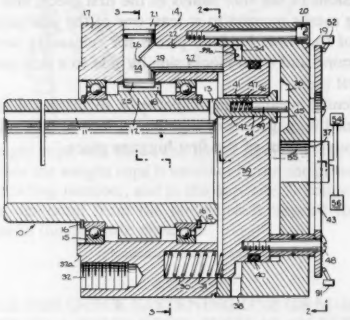


1. A torque overload release drive unit including first and second torque input and torque output sections, said sections including coacting means coupling said sections together for relative rotation, and limited relative displacement along the axis of relative rotation of said sections, said input section including means for applying rotational torque thereto and said output section including means for applying rotary torque to a rotary driven member, spring means connected between said sections yieldingly biasing said sections toward one set of limit positions of displacement along said axis, one of said units including spiral ramp means concentric with said axis and the other of said sections including follower means engaged with said ramp means, said spiral ramp means terminating at one end thereof in a circumferential race means onto which said ramp means opens and in which the follower means is guidingly receivable for continuous movement therethrough after movement along said ramp means from the end thereof remote from said race means into the latter, said sections being displaced along said axis against the biasing action of said spring means during movement of said follower means along said ramp means toward said race means.

4,081,063
OVERLOAD RELEASE CLUTCH

Edward T. Malmros, Clark, and Franz J. Swart, Rahway, both of N.J., assignors to Centric Clutch Company, Woodbridge, N.J.

Filed Jul. 15, 1976, Ser. No. 705,438
Int. Cl.[2] F16D *43/20*
U.S. Cl. 192—56 F 25 Claims

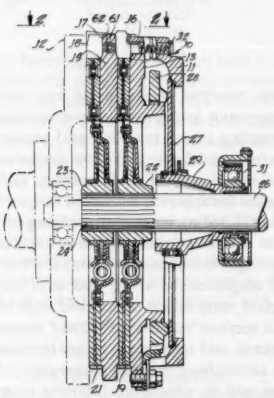


1. An overload release clutch mechanism comprising; a housing member, a rotor member, means mounting said members for relative rotation, means associated with said members for effecting transmission of rotary movement of one of said members to the other of said members by effectively engaging said members, said last mentioned means being effective to disengage said members upon the application of a torque exceeding a predetermined value to one of said members, and means operative at any time during the operating cycle of said mechanism automatically to vary the torque level at which disengagement occurs.

4,081,064
DRIVE CONNECTION FOR THE PRESSURE PLATE OF A FRICTION CLUTCH

Grant H. Smith, Rockford, and John C. Hayter, Rockton, both of Ill., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed Sep. 13, 1976, Ser. No. 722,924
Int. Cl.[2] F16D *13/50*
U.S. Cl. 192—70.15 3 Claims

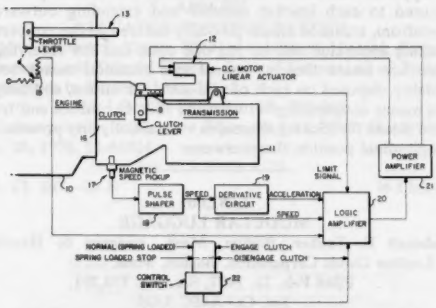


1. A friction clutch including a rotatable housing and at least one rotatable pressure plate, said housing including a slot in a peripheral wall thereof and said pressure plate including a radially extending drive lug disposed within said slot for imparting rotary driving motion to said pressure plate while permitting axial movement of said pressure plate with respect to said housing, wherein the improvement comprises a replaceable wear shoe disposed within said slot, said wear shoe including a substantially flat base portion in surface to surface contact with a wall of said slot, the flat base portion of said wear shoe extending inwardly and outwardly beyond the surface of said slot wall, said wear shoe including spaced inner and outer clip portions extending laterally with respect to said base portion, each of said inner and outer clip portions merging into said flat base portion, said inner clip portion being formed in a U-shaped configuration defining an edge engageable with an inner surface of said peripheral wall of said housing, said edge of said inner clip portion serving to define a spacer for locating said flat base portion with respect to said wall of said slot.

4,081,065
CONTROLLED POWER CLUTCH

Robert R. Smyth, Morningside La., Lincoln, Mass. 01773, and William B. Smyth, 2979 Forest Dr., Pepper Pike, Ohio 44124

Filed Dec. 23, 1976, Ser. No. 753,639
Int. Cl.[2] F16D *23/00, 23/10, 47/00*
U.S. Cl. 192—.076 13 Claims



1. A power controlled clutch for coupling a driven shaft to the crank shaft of an engine having an adjustable throttle comprising,

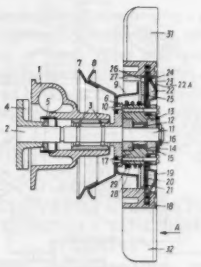
first and second engageable clutch elements, said first clutch element being connected to said crank shaft and said second clutch element being connected to said driven shaft,

control means for controlling the amount of engagement of said engageable clutch elements, said control means having a first state in which said first and second clutch elements are completely disengaged, a second state in which said first and second clutch elements are completely engaged providing a positive mechanical link between said crank shaft and said driven shaft, and a third state occurring during the transition from said first state to said second state, when said first and second engageable elements are partially engaged, said control means being operative during said third state to engage said first and second clutch elements sufficiently to maintain the speed of rotation of said drive shaft at a value in predetermined relation to the adjustment position of said throttle and the acceleration of said drive shaft.

4,081,066
AUTOMATICALLY ACTUATABLE FAN CLUTCH, IN PARTICULAR FOR COOLING SYSTEMS FOR INTERNAL COMBUSTION ENGINES

Anton Ryba, Bozen, Italy, assignor to AUVE Patentverwertungsgesellschaft mit beschrankter Haftung, Munich, Germany

Filed Aug. 2, 1976, Ser. No. 710,390
Claims priority, application Austria, Oct. 22, 1975, 8038/75
Int. Cl.[2] F16D *25/04, 43/25*
U.S. Cl. 192—82 T **10 Claims**



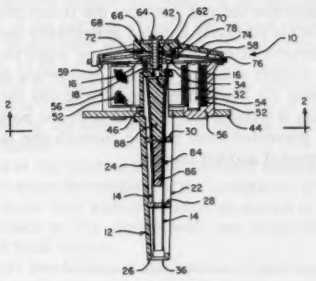
1. In an automatically actuatable fan clutch, in particular for cooling systems of internal combustion engines, the improvement comprising a thermostat secured to said fan and rotatable therewith, said thermostat being positioned so that it is swept over by the moving cooling air, said thermostat comprising a gas-tight annular container having a solid metallic wall and an axially flexible wall, said annular container having a liquid therein, the boiling point of which is approximately in the temperature range at which said fan clutch is supposed to be engaged, means for guiding said liquid to the radially outer periphery in response to a rotation of said annular container, said flexible wall expanding into engagement with a friction clutch member in said fan clutch to couple the fan to a drive shaft in response to a gas pressure occurring inside of said container due to said liquid having reached the boiling temperature, said liquid being contained in such amounts in said container that a part thereof remains still liquid even in the case of the highest occurring cooling air temperature and is rotated with said container so that this liquid is moved by centrifugal force to said outer periphery of said container to effect the application of an additional axially acting pressure onto said flexible wall and resilient means normally urging said friction clutch member out of clutch engaging relation, the force of said resilient means being greater than the amount of force generated by said non-boiling liquid on said flexible wall during rotation of said annular container and less than the force generated by said gas from said boiling liquid.

4,081,067
INTERNAL VIBRATION DAMPENING MEANS FOR PRINTING MECHANISM

Robert L. Schrag; Harold A. Long, and Robert T. Harvey, all of Wichita, Kans., assignors to NCR Corporation, Dayton, Ohio

Filed Mar. 7, 1977, Ser. No. 775,234
Int. Cl.[2] B41J *3/04*
U.S. Cl. 197—1 R **13 Claims**

1. A printing mechanism comprising:
frame means including at least one transverse support member located in a position spaced from each of the ends of the frame means;
a plurality of elongated printing elements extending through and supported by said support member in an array of generally conical configuration and capable of being driven in an axial direction to effect printing;
driving means operatively connected to said printing elements for axially driving said printing elements; and
dampening means of generally conical configuration disposed completely within said array of elongated printing elements, secured to said support member and having a

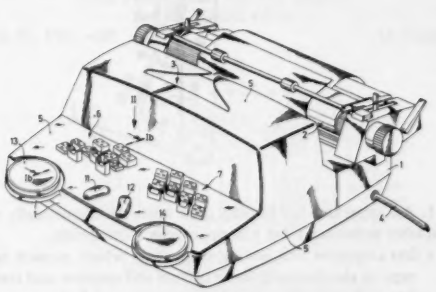


surface from which each of the elongated printing elements is physically separated when at rest and when in normal axial movement, said dampening means being positioned to limit undesired transverse movement and vibration of said elongated printing elements during and following operation thereof by said driving means.

4,081,068
KEYBOARD ACTUABLE WITH THE AID OF THE FINGERS OF AT LEAST ONE HAND

Walter Zapp, Ebenau 877, CH-9413 Oberegg, Switzerland

Filed Oct. 4, 1976, Ser. No. 729,075
Claims priority, application Switzerland, Aug. 4, 1976, 010048/76
Int. Cl.[2] B41J *5/08*
U.S. Cl. 197—98 **12 Claims**



1. An individual actuating key unit for use in a keyboard, actuatable with the aid of fingers of at least one hand, which unit comprises a supporting frame, a key having a top face destined for having the tip of a finger rest thereon, a key rod on the underside thereof, a non-depressable mounting whereby said key rod is mounted in said supporting frame and is disposed in a rest position at right angles to a bearing plane of said supporting frame, at least one contact switch having a stationary and a movable contactor, said key rod bearing said movable contactor near the tiltable key-bearing end thereof, an electrical operating circuit into which said switch is inserted, said switch being opened in a rest position of the key without making contact, thereby interrupting the flow of current through said operating circuit, and being closable by movement of said key away from said rest position, thereby making contact and thereby closing said operating circuit, said key being advised to have the tip of the finger used for actuating the key rest thereon and capable of supporting random vertical

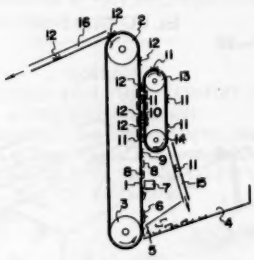
pressure thereon by said finger-tip without having said key rod making electrical contact, and said movable contact being so disposed on said key rod as to make electrical contact when said key and key rod are tilted out of their rest position by means of movement of the fingertip, said actuating unit further comprising a return device for moving the key from an actuated position into the rest position, the return movement of which device is positively initiated immediately upon completion of contact-making by the key, even when the finger-tip continues to exert actuating pressure, said return device comprising means for limiting movement whereby the positively returned key is arrested and retained in its rest position, and is positively prevented from passing through the latter in the direction toward another contact.

4,081,069

FEEDING APPARATUS FOR CAPS MADE OF MAGNETIC SUBSTANCE

Hiroshi Ono, Kanazawa, Japan, assignor to Shibuya-Kogya Company, Ltd., Kanazawa, Japan

Filed Dec. 8, 1972, Ser. No. 313,600
Claims priority, application Japan, Mar. 13, 1972, 47-25382
Int. Cl.² B65G *47/24*
U.S. Cl. 198—384 **2 Claims**



1. An apparatus for feeding caps made of magnetically attractable substance from a hopper, which comprises:

a first conveyor belt having magnetism which attracts said caps by the magnetic force thereof and receives and transfers said caps from said hopper onto said first conveyor belt;

a baffle provided in operative relation to said first conveyor belt for displacing overlapping caps on said first conveyor belt so that a single layer of caps is formed on said first conveyor belt, with said caps being arranged so that either the front sides thereof or the back sides thereof face outwardly of said first conveyor belt;

said baffle comprising two elastic plates disposed opposite one another on opposite sides of said first conveyor belt and connected by a connecting rod at the upper ends thereof, said connecting rod being reciprocated by a reciprocating means in a direction at right angles to the moving direction of said first conveyor belt; and

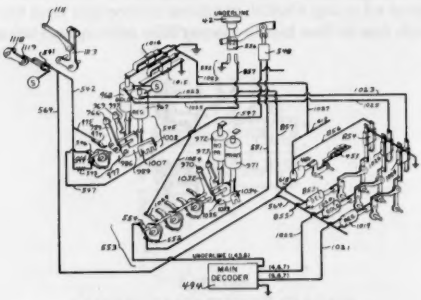
a second conveyor belt having magnetism which is provided downstream of said baffle on said first conveyor belt, and is positioned close to said first conveyor belt to attract and transfer to said second conveyor belt only the caps disposed in front side out position on said first conveyor belt.

4,081,070

UNDERLINING DEVICE FOR JUSTIFYING TEXT WRITING REPRODUCING MACHINE

William S. Gubelmann, deceased, late of Oyster Bay, N.Y.; by Walter S. Gubelmann, executor, Palm Beach, Fla., and William R. Grier, New Vernon, N.J., assignors to Realty & Industrial Corporation, Morristown, N.J.

Division of Ser. No. 212,895, Dec. 28, 1971, Pat. No. 3,945,480.
This application Dec. 16, 1975, Ser. No. 641,364
Int. Cl.² B41J *29/26*
U.S. Cl. 197—113 **2 Claims**



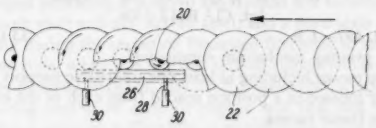
1. A text writing apparatus for printing text in response to coded input signals, including sensing means, means for applying coded input signals to said sensing means, wherein a first coded input signal corresponds to an underline to be printed, and different second coded input signals correspond to separate text characters to be printed, said apparatus comprising means responsive to said first and second coded input signals for printing said underline and text characters respectively on a medium, means responsive to said second coded signals for moving said medium relative to said printing means in a direction of a line of text to be displayed, said means for moving being unresponsive to said first coded input signals, said means for applying coded signals to said sensing means comprising means responsive to the sensing of said second coded signals and the subsequent completion of movement of said means for moving for sequentially applying further coded input signals to said sensing means, said means for applying coded signals to said sensing means being independent of said means for moving in response to the sensing of said first coded input signals, contact means responsive to operation of said means for moving, said contact means being connected to inhibit operation of said means for applying until completion of the printing operation of a character of text, and means for shunting said contact means in response to the receipt of said first coded input signal.

4,081,071

CONVEYOR SYSTEMS

Jacob August Nielsen, Viby J., Denmark, assignor to Kosan Crisplant A/S, Denmark

Filed Sep. 19, 1975, Ser. No. 614,941
Claims priority, application United Kingdom, Sep. 23, 1974, 41239/74
Int. Cl.² B65G *43/00*
U.S. Cl. 198—365 **11 Claims**



1. A conveyor arrangement for conveying and unloading articles, comprising a train of consecutive article carrier ele-

ments moving in a main conveying direction, each of said carrier elements being provided with article supporting means arranged so as to be selectively movable crosswise to said main conveying direction for effecting unloading of an article resting thereon, characterized in that said article supporting means are consituted by rotary disc members, means are provided for rotatably mounting the rotary disc members on the article carrier elements, said rotary disc members being arranged on the article carrier elements so as to overlap each other in such a manner that each disc member is partly covered by a part of the preceding or the following disc member, means being provided for rotating the disc members selectively for effecting said unloading of an article resting on one or more of the disc members.

11. A conveyor arrangement comprising a plurality of parallel, closely juxtaposed rows of rotary discs, means for rotatably mounting the discs of each row, said rotary discs being mounted so as to overlap each other in such a manner that each disc is partly covered by a part of the preceding or the following disc, and driving means being provided for selectively rotating the discs.

4,081,072

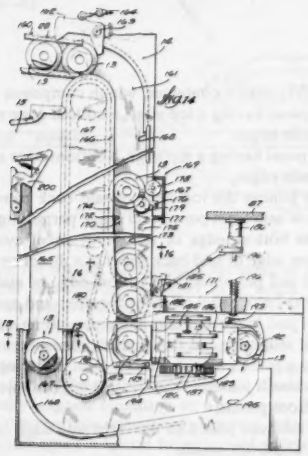
AUTOMATIC CONVEYOR SYSTEM FOR MOVING ARTICLES SUCCESSIVELY TO A SERIES OF WORK STATIONS

Arnold P. Le Vasseur, Lakeville, Minn., assignor to Possis Corporation, Minneapolis, Minn.

Division of Ser. No. 672,867, Apr. 2, 1976, Pat. No. 4,012,834, which is a division of Ser. No. 607,048, Aug. 22, 1975, Pat. No. 3,980,184, which is a division of Ser. No. 477,549, Jun. 7, 1974, Pat. No. 3,920,129. This application Dec. 10, 1976, Ser. No. 749,367

Int. Cl.[2] B65G 47/24

U.S. Cl. 198—394 **5 Claims**



1. An automatic conveyor system comprising:

A. a plurality of carriers, each of which has an axis of rotation, an axial cavity to receive an article in a defined orientation with respect to said axis of rotation, and coaxial circular and non-circular portions, the former being larger in diameter than the maximum transverse dimension of the latter and providing a circular surface on which the carrier can roll, and the smaller non-circular portion having a flat surface spaced radially from said axis of rotation;

B. first and second connecting track sections leading to a loading station at which articles are inserted into the carriers,

(1) the first track section being formed by parallel vertically spaced downwardly inclined rails spaced apart a distance to receive therebetween said circular portion of the carriers, and along which the carriers roll with their axes horizontal towards the second track section; and

(2) said second track section being substantially vertically disposed and formed by parallel rails spaced apart a distance to receive therebetween the non-circular portion of the carriers with the flat surface thereof in sliding engagement with one of said second track section rails, so that during traverse of the carriers along said second track section the carriers are restrained against rotation to assure that they will arrive at said loading station in the same position of rotation with their axes horizontal;

C. means at the junction of said first and second track sections to arrest the progress of the carriers and to rotate the same about their axes of rotation as needed to align said flat surface on the carriers with one of the rails of said second track section;

D. transfer mechanism at the bottom of said second track section to receive carriers therefrom and present them to the loading station while restraining the carriers against rotation about their axes of rotation, said transfer mechanism having a plurality of nests, each of which is of a size and shape to receive a single carrier as it is presented thereto with its axis horizontal, and means to rotate each nest a quarter of a turn about an axis normal to the axis of a carrier therein to thereby tip the carrier from its axially horizontal disposition to a position in which its axis is vertical in preparation to being presented to the loading station; and

E. gate means at the bottom of said second track section to feed the carriers one at a time to said transfer mechanism.

4,081,073

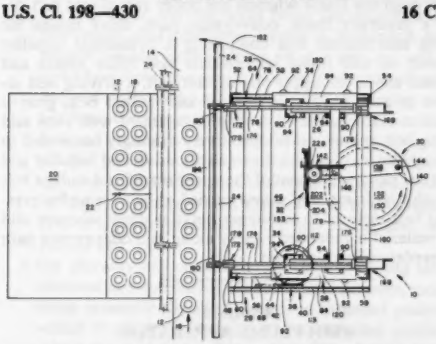
APPARATUS FOR TRANSFERRING PARTS

Anthony T. Zappia, Carmel, Ind., assignor to Powers Manufacturing, Inc., Elmira, N.Y.

Filed Jun. 1, 1976, Ser. No. 691,493

Int. Cl.[2] B65G 47/82

U.S. Cl. 198—430 **16 Claims**



1. In an apparatus for transferring parts moving in a first direction along a first conveyor to a second conveyor to move such parts in a second direction along said second conveyor comprising a push bar for contacting and transferring the parts, a carriage for supporting the bar, a base for movably supporting the carriage, first drive means for moving the bar from a starting position adjacent the first conveyor toward the second conveyor, means for raising the bar after it has transferred the articles from the first conveyor onto the second conveyor and for maintaining the bar in a raised position for a portion of its operating cycle, means for movably mounting the bar with respect to the carriage, and second drive means for moving the bar with respect to the carriage, the improvement wherein the second drive means comprises at least one drive arm for mov-

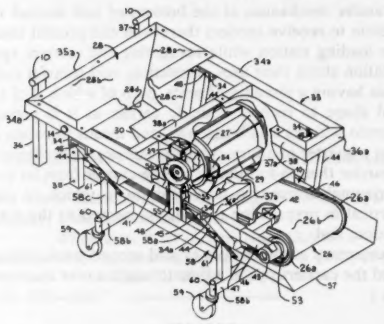
ing the bar mounting means, the drive arm being pivotally coupled to the bar mounting means and to the carriage, and means for driving the drive arm pivotally and the carriage reciprocally relative to the base, said means for driving the drive arm comprising a rack fixedly mounted on the base and a pinion gear mounted on the carriage for reciprocal motion therewith, said pinion gear engaging the rack and having a vertical pivot axis, the pinion gear being coupled to the drive arm to drive it pivotally about said vertical axis whereby when said pinion gear rotates the bar mounting means pivots in an arc as the carriage reciprocates with respect to the base.

4,081,074

BULK MATERIAL DISPENSING DEVICE

Paul A. Stone, 10961 Madison Rd., Huntsburg, Ohio 44046

Filed Mar. 22, 1976, Ser. No. 668,980
Int. Cl.[2] B65G *31/00*
U.S. Cl. 198—638 **13 Claims**



1. An inertial bulk material dispensing device for transporting and propellantly dispensing bulk material comprising a frame having roller means at opposite ends thereof, an endless belt suspended upon and between said roller means and extending through the frame wherein the upper run of said belt defines a generally linear conveyance path, drive means for driving said endless belt comprising a cylindrical impeller mounted on said frame intermediate said roller means and disposed above the upper run of said belt, a driving belt attached to each transverse edge of said endless belt, groove means on said impeller in driving engagement with each said driving belt, motor means operatively drivingly connected to said impeller and operable to rotatably drive said impeller and effect the rapid movement of the upper run of said endless belt through said frame, and means carried on said frame for presenting bulk material to said upper run of said belt whereby said bulk material is propelled rapidly along said conveyance path to a predetermined location.

4,081,075

FISH FLUME APPARATUS

Mario J. Puretic, 259-6th Ave. North, Monte Cristo Isle, Tierra Verde, Fla. 33715

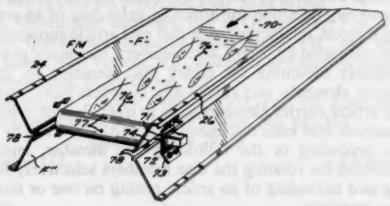
Filed Jun. 3, 1975, Ser. No. 583,282
Int. Cl.[2] B65G *15/60*
U.S. Cl. 198—812 **5 Claims**

1. A flume apparatus assembly for transporting fish along a desired path, said apparatus comprising:

a first plurality of like, telescoping, nestable flume members of generally half-hexagonal transverse cross-sectional having a horizontal bottom wall and upwardly and outwardly extending side walls, said side walls having flanges at their upper ends;

connector means engageable with said flanges to temporarily interconnect said flume members together overlapped and in a desired longitudinal array; and

a second plurality of flume members like said first plurality of flume members, with one of each of said second plurality of flume members being positioned inverted below one



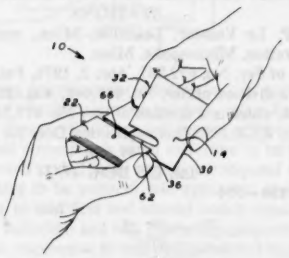
of said second plurality of flume members and secured thereto.

4,081,076

CHILD-PROOF MATCH CONTAINER

Jean Paul Eisele, 6 Morris La., Great Neck, N.Y. 11024

Filed Aug. 2, 1976, Ser. No. 710,425
Int. Cl.[2] A24F *27/00*
U.S. Cl. 206—106 **7 Claims**



1. A safety match container, which comprises;

a back panel having a top edge, a bottom edge and right and left side edges;

a front panel having a top edge, a bottom edge and right and left side edges;

a hinge joining the top edge of said back panel to the top edge of said front panel, said hinge permitting withdrawal of the bottom edge of said front panel away from the bottom edge of said back panel in a direction toward said hinge and permitting the bottom edge of said front panel and the back panel to pivot together and apart in an arc about said hinge and said hinge permitting a lateral pivoting of said back and front panels in respect to each other about a pivot point at the center of said hinge;

a left sidewall joined to the left side edge of one of said back and front panels;

a right sidewall joined to the right side edge of one of said back and front panels;

a cover panel extension of the bottom edge of the back panel;

a chamber for containing safety matches, defined by said hinge and front and back panels and sidewalls;

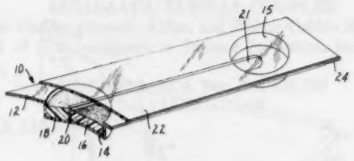
means for mounting said matches in said chamber; and

lock means for preventing the bottom edge of said front panel from moving away from the bottom edge of said back panel in a direction toward said hinge and for preventing the bottom edge of said front panel and the back panel from pivoting apart in an arc about said hinge, said lock being releasable only by the lateral pivoting of said back and front panels in respect to each other, about the pivot point at the center of said hinge, said lock means comprising a tab formed on the bottom edge of said front panel and a tab engaging member for engaging said tab, mounted on the cover panel.

4,081,077
COMPARTMENTED PACKAGE

Gerald R. Franck, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jan. 13, 1977, Ser. No. 759,139
Int. Cl.² B65D 25/08
U.S. Cl. 206—219 9 Claims

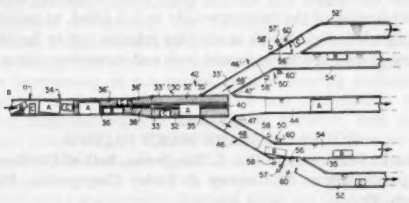


1. A compartmented package comprising a unitary body member having a cavity therein adapted to contain at least two co-reactive components separated into compartments by means of an elongated mixing tool, the top portion of said cavity being closed by means of an openable cover member, wherein a portion of said mixing tool is fitted into a slot-shaped depression in said body member.

4,081,078
ARTICLE SORTING APPARATUS

Bruce E. Richardson; Rudy Oetliker, and W. Doug Grierson, all of London, Canada, assignors to Labatt Breweries of Canada Limited, London, Canada

Filed Mar. 31, 1976, Ser. No. 672,453
Claims priority, application Canada, Apr. 16, 1975, 225025
Int. Cl.² B07C 5/06
U.S. Cl. 209—82 7 Claims

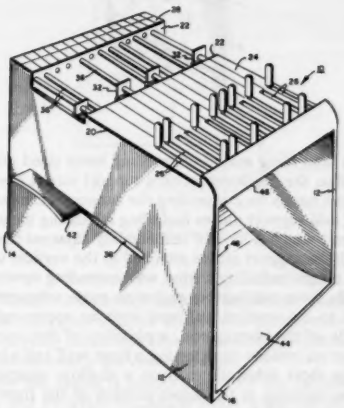


1. A device for sorting substantially rectangular articles of various lateral dimensions contained in a single conveyor stream into two separate conveyor streams, one stream containing articles having a lateral dimension above a pre-determined value and a second stream having a lateral demension below the pre-determined value, said device comprising conveyor means for supplying the single stream of said articles in a longitudinally aligned condition to a conveyor having an article supporting surface comprising members, which in operation, constantly apply a lateral force to said articles to urge same toward an article restraining means and a powered chain loop at a side of the conveyor remote from the article restraining means from which it is spaced more than said pre-determined value but less than the width of the larger articles, means on said loop being provided to contact and impart to an article travelling on said conveyor when said article has a lateral dimension greater than said pre-selected size a force only in the longitudinal direction of travel of said article, said conveyor having an article discharge end terminating at a branching unit having a mainstream conveyor passage colinear with said conveyor and a subsidiary conveyor passage angled away from the conveyor side containing said restraining means and into which subsidiary conveyor articles having a lateral dimension below said pre-selected value are projected by said article supporting surface whilst articles having a lateral dimension above said pre-selected value are urged by said chain loop past said subsidiary conveyor to continue along said main conveyor.

4,081,079
MANUALLY PROGRAMMABLE CARD SELECTOR APPARATUS

Leo Roth, and Ursula Roth, both of 52-27 69th St., Maspeth, N.Y. 11378

Filed Nov. 26, 1976, Ser. No. 744,982
Int. Cl.² B07C 7/00
U.S. Cl. 209—110.5 4 Claims



1. A manually operable device for selectively extracting at least one data carrying card from a collection of rectangular data carrying cards, said cards having top horizontal edges, said device comprising:

a hollow container having first and second parallel vertical side walls disposed between first and second parallel vertical end walls, the end walls being perpendicular to the side walls, said container having a horizontal bottom section secured to the bottom of said side and end walls and a horizontal top section secured to the top of said side and end walls, said top section having an opening extending from the first end wall to a position intermediate the first and second end walls and further having a plurality of parallel grooves in the top surface which extend from said opening toward the second end wall, said second end wall having an opening which extends from said bottom section to a point intermediate the top and bottom of said second end wall;

a like plurality of horizontal rods, each rod being slidably disposed in a corresponding one of said grooves, each rod being manually slidable between an extended position at which it spans the opening and a retracted position at which it is withdrawn from said opening; and

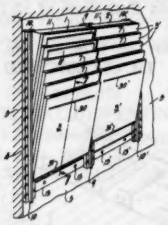
a plurality of vertical clips, each clip being secured to the said card edge of a card with an aperture therein coplanar with said card and disposed above said card edge, said cards being disposed within said opening in side by side position with said apertures being disposed along a like first plurality of horizontal lines, each line being aligned with a corresponding one of said grooves, each rod when in extended position extending through all of the apertures in the corresponding line to support the cards having said apertures in raised position within the container, each rod when in retracted position releasing said support, all unsupported cards falling to the bottom section and being manually removable from said container through said second end wall opening.

4,081,080

DOCUMENT FILING ASSEMBLY

Robert L. Rorex, Ridgecrest, Calif., assignor to Kole Enterprises, Inc., Miami, Fla.

Filed Dec. 30, 1975, Ser. No. 645,320
Int. Cl.[2] A47F 7/00; G09F 1/10
U.S. Cl. 211—55 5 Claims



1. In a wall filing assembly for filing letter sized documents and the like, the combination of: a support means having wall attachment means for connecting the support means to a vertical wall, said support means including a locating means with a bottom end which is located immediately adjacent the vertical wall with the support means attached to the vertical wall, said locating means including a front wall extending upwardly and outwardly from said bottom end at an angle substantially less than 45° to the vertical wall and with an upper end spaced outwardly of the bottom end, a plurality of thin rectangular document receptacles each having a front wall and a back wall joined by short sidewalls to form a shallow receptacle and having an opening at the upper portion of the front wall to receive letter sized documents for filing, said receptacles being located in a staggered stacked relation upon said support means with the back wall of a first receptacle abutting the locating means and the front wall of the first receptacle abutting the back wall of the second receptacle in the stack and with the front and back walls of other receptacles in said stack correspondingly located, the top of the second receptacle and each succeeding receptacle being located below the top of the first receptacle and each preceding receptacle, each of said receptacles having a first rear support part on the back wall of the receptacle and a second front support part on the front wall, said locating means having a front support part complementing said rear support part of each receptacle and said first receptacle having said rear support part located in said front support part of said locating means, said second receptacle having the rear support part located in the front support part of the first receptacle and each succeeding receptacle of said plurality of receptacles having its rear support part located in the front part of the preceding receptacle, said support means and said receptacles having further support parts engaging and holding the lower ends of the receptacles adjacent the vertical wall to support said receptacles with the upper end located outwardly of the bottom end of each receptacle and thereby locate the interconnected receptacles in a forwardly tilted position to facilitate access to the opening in the front walls.

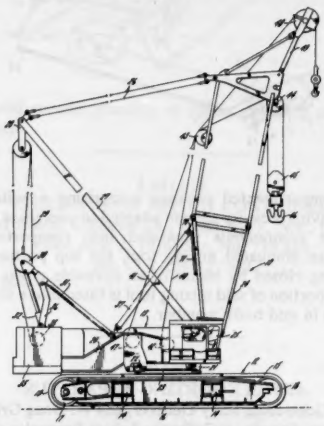
4,081,081

DEMOUNTABLE GANTRY, BOOM HOIST AND COUNTERWEIGHT

James G. Morrow, Sr.; David J. Pech, and Jay Borstad, all of Manitowoc, Wis., assignors to The Manitowoc Company, Inc., Manitowoc, Wis.

Continuation-in-part of Ser. No. 625,119, Oct. 23, 1975, abandoned. This application Oct. 26, 1976, Ser. No. 735,812
Int. Cl.[2] B66C 23/72
U.S. Cl. 212—49 6 Claims

1. A demountable counterweight and back hitch assembly for a lift crane having a supporting bed with horizontally apertured mounting plates on the rear end thereof, a gantry pivotally mounted on the bed and a hydraulic cylinder connected between the rear end of the bed and the free end of the gantry, comprising, in combination, a counterweight having vertical web means with horizontal apertures therein for registry with said mounting plate apertures, locking pins for insertion through said apertures, linkage means interconnecting the counterweight and gantry for lifting the counterweight when the hydraulic cylinder is extended, said linkage means including a lift arm on the counterweight pinned forward of the



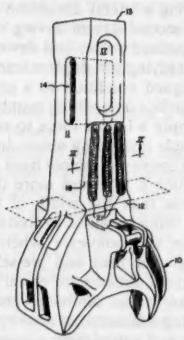
center of gravity of the counterweight to a toggle link which is, in turn, pinned to a lift link connected to the gantry, said toggle link and lift link having intermediate end portions butted together adjacent the front edges thereof when the counterweight is being lifted, and adjusting means interposed between the toggle link and the front edge of the lift arm to prevent tipping of the counterweight as it is lifted, to maintain the toggle link and lift link in abutting relation and to facilitate registry of said apertures in said web and mounting plates.

4,081,082

COUPLER SHANK HARD FACING

Charles L. Scherrer, and Don L. Baughman, both of Pittsburgh, Pa., assignors to McConway & Torley Corporation, Pittsburgh, Pa.

Filed Nov. 22, 1976, Ser. No. 743,948
Int. Cl.[2] B61G 1/38
U.S. Cl. 213—62 A 4 Claims



1. In a railway coupler including a shank having a bottom wall facing a coupler carrier, the improvement comprising a wear-resistant shank surface consisting of a hard-facing deposit of weld metal upon said bottom wall for engaging said coupler

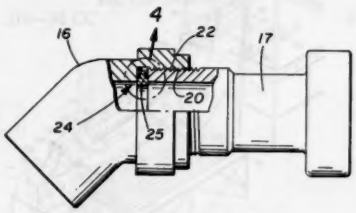
carrier, said weld metal being the only bearing surface engaging said coupler carrier and comprising parallel tracks of weld metal each having a thickness of at least 1/8 inch and extending between the horn line and connector opening of said coupler shank, the weld metal comprising a cobalt-chromium-tungsten alloy and having a hardness of at least Rockwell C54.

4,081,083

AUTOMATIC SUBWAY COUPLER

Wilbert Gordon Glauser, Alden, and Walter Cabble Dilg, Elma, both of N.Y., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Sep. 3, 1976, Ser. No. 720,190
Int. Cl.[2] B61G *5/08*
U.S. Cl. 213—76 **5 Claims**



1. In an automatic subway coupler having a body comprising a head with a front face, a shank extending from the head and having a butt end opposite the head with an apertured loop for pivotal connection, a hook extending from the front face, at least one air line connector in the form of an apertured cylindrical conduit connected rearwardly of the head to a bushing extending longitudinally through the head to the front face for mating with a similarly constructed coupler and a sealing means between the bushing and air line connector, the improvement comprising the bushing containing an outer threaded surface terminating in an outer bearing vertical surface, the air line connector containing an inner threaded surface terminating in a recessed vertical bearing surface, said threaded surfaces being connected and said sealing means being disposed between the bearing surfaces, said sealing means comprising a circular flat ring and seal holder having a front face and a rear face, said front and rear faces containing an annular groove with an annular seal member disposed therein and a seal member disposed about the diametral periphery of said holder.

4,081,084

CASING HANDLING SYSTEM

David C. Guinn; Archie K. Haggard, and John P. Thomas, all of P.O. Box 1126, Houston, Tex. 77001

Filed Oct. 4, 1976, Ser. No. 729,493
Int. Cl.[2] E21B *19/14*
U.S. Cl. 214—1 P **7 Claims**

1. A casing handling system for moving casing from a casing rack to a casing racker located a horizontal and vertical distance from the casing rack comprising,

a pair of immovably mounted davits having a loading station adjacent the casing rack and extending to and having a delivery station adjacent the casing racker,

the davits being transversely spaced from one another a distance greater than the length of the casing,

a gear track on a surface of each of the spaced davits,

a crane assembly, including,

a trolley movably disposed on each davit,

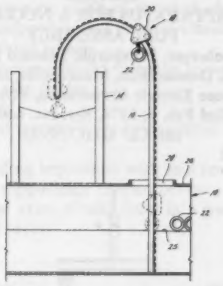
a motor-driven sprocket carried by each trolley meshing with the gear track on the davit on which it is movably disposed operable to move the trolley on the davit,

a motor carried by the crane assembly operable to drive the sprockets,

a cross member connected and extending transversely between the trolleys securing the trolleys together so that they move as a unit on the davits,

a pair of transversely spaced carrying members disposed below the cross member having support members arranged to move transversely and freely into and out of opposite ends of the casing for load-carrying support of and removal from the casing,

means connected to the spaced carrying members operable to move the members into and out of the opposite ends of the casing, and



swivel means connecting the last mentioned means to and below the cross member effective to permit swiveling of the carrying means and thus of the casing when carried to a position below the cross member,

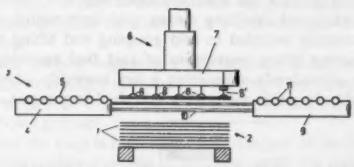
whereby the casing is supported below the carrying members and between the davits when being moved by the casing handling system from the loading stationt to the delivery station.

4,081,085

APPARATUS FOR RAISING AND FEEDING FLAT WORKPIECES FROM A STACK

Eduard A. Haenni, Zofingen, Switzerland, assignor to Haennerle A.G., Zofingen, Switzerland

Filed Dec. 23, 1976, Ser. No. 754,021
Int. Cl.[2] B65G *59/04*
U.S. Cl. 214—1.6 **4 Claims**



1. An apparatus for grasping and raising flat workpieces lying in a stack and for feeding the single workpiece thus raised to an adjacent processing station to a shear or a press, comprising:

a lifting device arranged above said stack;

suction lifters on said lifting device for grasping and raising the uppermost workpiece in a stack;

a track extending below said lifting device and said suction lifters from a first location under the stack of flat workpieces to a second location at the processing station which is outside the range of the lifting device;

a carriage provided with rollers and moveable impact arms being displacable on said track, said carriage including control means operative on said impact arms so that a workpiece which is initially raised and placed by the suction lifters of said lifting device on said rollers is fed to said processing station by the moveable impact arms

means to displace said carriage during each workpiece lifting operation while said lifting device is in its raised position whereby said carriage lifting device is displaced on said track from an initial position lying outside the effective region of said lifting device to a loading position after raising of the workpiece has taken place; and

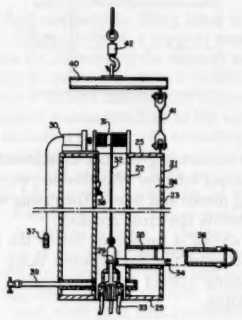
said loading position being adjacent the processing station and under the raised workpiece for taking over the workpiece.

4,081,086

HANDLING APPARATUS FOR A NUCLEAR REACTOR FUEL ASSEMBLY

John M. Shallenberger, Pittsburgh; Leonard P. Hornak, Irwin, and Walter E. Desmarchais, Monroeville, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 6, 1974, Ser. No. 440,105
Int. Cl.[2] G21C *19/32*
U.S. Cl. 214—2 **7 Claims**



1. Apparatus for handling an elongated radioactive fuel assembly during dry transfer operations comprising means for shielding said fuel assembly during said dry transfer operations, said fuel assembly being positioned within said shielding means during said transfer operations and means mounted on said shielding means for grasping and lifting said fuel assembly longitudinally within and relative to said shielding means, limit switch means located within said shielding means and positioned to engage said fuel assembly when said fuel assembly is entirely within said shielding means, said limit switch means being electrically coupled to said grasping and lifting means for terminating lifting movement of said fuel assembly and means for redundantly supporting a fuel assembly when said fuel assembly is positioned within said shielding means.

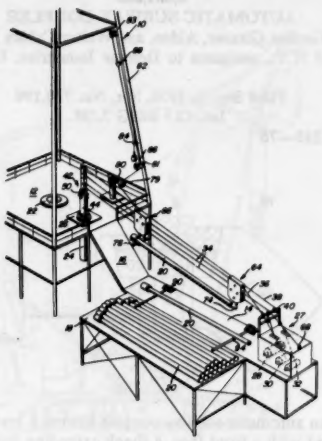
4,081,087

PIPE LAYDOWN AND PICKUP MACHINE

Richard B. Freeman, Sr., 1230 W. Main St., Houma, La. 70360

Filed Jan. 21, 1976, Ser. No. 651,159
Int. Cl.[2] E21B *19/14*
U.S. Cl. 214—2.5 **5 Claims**

1. A pipe laydown and pickup apparatus for use in combination with an on-site well rig including a derrick provided with a rig floor having a rathole pipe associated therewith and a catwalk extending outwardly from the derrick alongside a pipe rack comprising a draw works oriented at the outer end of the catwalk with a cable assembly connected therewith, a support means for the cable assembly inserted into the rathole pipe, said cable assembly supporting a pair of pipe sections supporting dollies for movement thereon and for vertical movement when the cable assembly is slackened or tightened in order to pick up a pipe section from the catwalk and convey it toward the drill rig floor or convey a pipe section from the drill rig to the catwalk, said cable assembly including a supporting cable having one end anchored to the draw works and the other end wound on a winch drum on the draw works with an intermediate portion supported by a pulley on the cable assembly support means in the rathole pipe with the two runs of the cable being vertically spaced, each of the dollies including a plurality of pulleys thereon engaged both runs of the cables for maintaining the dollies in a stable, vertical orientation, said cable assembly also including a cable attached to the dolly remote



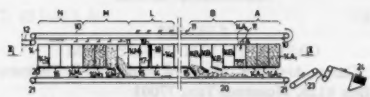
from the drill rig and wound on a winch drum on the draw works for moving the remote dolly toward and away from the drill rig, said cable assembly support means including a support member telescopically adjustable in the rathole pipe with means locking the support member in vertically adjusted positions to vary the elevational position of the cable assembly in relation to the drill rig floor.

4,081,088

METHOD AND APPARATUS FOR HANDLING ARTICLES OF DIFFERENT TYPES

Alpo Rysti, Frisansintie 22, 02240 Espoo 24, Finland

Filed Nov. 24, 1976, Ser. No. 744,882
Claims priority, application Finland, Nov. 27, 1975, 753362
Int. Cl.[2] B65G *47/19*
U.S. Cl. 214—6 M **8 Claims**



1. In a method for handling articles, such as pieces of timber, of different types, the steps of subjecting the articles to a given treatement after receiving the articles from the discharge end of a conveyer, delivering articles of one type to a first plurality of compartments situated one after the other over said conveyer with one of the plurality of compartments situated nearer to the discharge end of the conveyer than the next compartment, delivering articles of a second type to a second plurality of compartments, also situated over the conveyer one after the other with one of the second plurality of compartments situated nearer to the discharge end of the conveyer then the next of said second plurality of compartments, and sequentially discharging the articles from a given one of said pluralities of compartments onto said conveyer first from that one of said given plurality of compartments which is nearest to said discharge end of the conveyer, in a manner providing on the conveyer an article layer of a given uniform depth, and then from the next of said given plurality of compartments

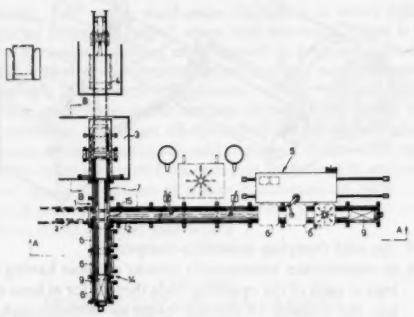
according to a program which will provide on the conveyer with the articles from the latter next compartment an article layer also of said given uniform depth and forming a continuation of the article layer derived from said one of said given plurality of compartments which is nearest to the discharge end of the conveyer.

4,081,089

ARRANGEMENT FOR HANDLING AND PREPARATION OF BASE PLATES AND THE LIKE SUCH AS, FOR EXAMPLE, CASTING MOLDS

Bo Georg Hammarqvist, Norberg, Sweden, assignor to AB Norbergs Mekaniska Verkstad, Norberg, Sweden

Filed May 27, 1976, Ser. No. 690,517
Claims priority, application Sweden, May 30, 1975, 7506210
Int. Cl.² B65G 67/02
U.S. Cl. 214—38 CC **9 Claims**



5. Apparatus for handling articles comprising:

at least two transport lines intersecting one another, each said transport line including a fixed elevated bed for supporting articles, at least one transport car in each transport line and movable therealong, each transport car including a chassis and an article support movable between raised and lowered positions respectively above and below the fixed bed of the corresponding transport line for lifting articles from and depositing articles on the latter fixed bed, the fixed bed in at least one transport line being interrupted to form an opening adjacent the intersection of said transport lines, and means for raising and lowering said article support including a support member extending between said support and said chassis when said support is raised, whereby articles transportable along said transport lines are transferable from one line to the other by lowering the support carried by the transport car in one transport line to deposit the article carried thereby on the bed adjacent the intersection of said lines and raising the support carried by the transport car in the other transport line to raise the article left by the transport car in the one transport line from the bed for transport along the other transport line by the transport car in said other transport line with said support member passing through the interruption in the one transport line upon transfer of the article from the one transport line to the other transport line.

4,081,090

IMPLEMENT TRANSPORTATION TRAIN

David L. Hopkins, Rte 1, Box 35B, Williams, Ariz. 80646

Filed Feb. 17, 1977, Ser. No. 769,689
Int. Cl.² B65G 67/02
U.S. Cl. 214—38 R **20 Claims**

1. In a transport train adapted for the hauling of a self-propelled front-loading implement having as its foremost extending member a scoop operable in the curling mode at the distal ends of a pair of lift arms,

one said arm on each side of said implement, each said arm replete with lift ram, bucket ram and ancillary linkages being duplicated on both sides of said implement,

through linkages about an upper and a lower pin, both pins engaging the scoop through supporting dual webs in the rear wall thereof,

said lower pin engaging a lift arm boss on said lift arm, a lift ram connected by a lift arm pin to said lift arm to hydraulically raise or lower said lift arm,

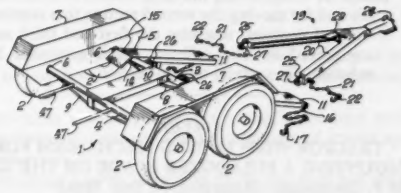
said scoop having a lip along its forward edge, said implement being equipped with 2 pairs of wheels of which the rear pair are drive wheels,

said implement being selected from the group consisting of back hoe and skip loader,

the combination of:

a. a four-wheeled tandem dolly having front and rear transverse axles;

b. said front-loading implement with said rear pair of drive wheels being supportably cradled between said front and rear transverse axles of said dolly in a position elevated above ground level;



c. a Y-form towbar;

d. the lip of said scoop of said implement engaging a rearwardly-directed lip hook provided at the fork of said Y-form towbar, the two arms of the Y being rearwardly directed under said scoop;

e. a length of chain with terminal hook extending from the end of each of said arms of the Y, each said chain on its respective side of the Y being threaded under and behind said scoop, over said lift arm behind said lower pin on its respective side, the chains being tightly secured each to the other by said terminal hooks;

f. the base of said Y-form towbar being provided at its forward-directed terminus with a conventional trailer coupler;

g. said coupler engaging a ball hitch provided as the rearmost extending member of a towing vehicle; and

h. the pair of front wheels of said implement being raised above ground;

whereby the train is road-ready for transport of the implement as a participating member of the train under the power of the towing vehicle.

4,081,091

WHEELCHAIR LIFT

Graham Roy Thorley, San Diego, Calif., assignor to Transportation Design & Technology, Inc., San Diego, Calif.

Continuation of Ser. No. 606,137, Aug. 20, 1975, Pat. No. 4,027,807. This application Feb. 17, 1977, Ser. No. 769,636
Int. Cl.² B62D 25/22 .
U.S. Cl. 214—75 R **6 Claims**

6. In the doorway of a vehicle, a wheelchair lift which in its stowed position forms the normal entrance steps comprising:

a multisectional platform which comprises:

a first section;

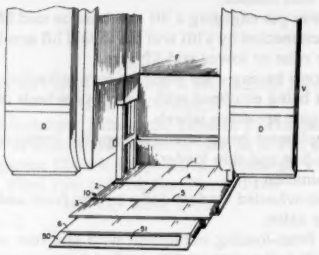
a second section located between the first section and a third section hingedly connected to said first and third sections, forming the central part of a flat load carrying surface of the platform when in a horizontal position;

the third section adjacent to the second section;

means for hingedly connecting the first section to the second section and the second section to the third section;

means for supporting said platform;

means for moving said platform between ground level and vehicle floor level whereby in its uppermost position



the first section lies across the doorway close to the vehicle floor;

means for withdrawing the third section toward the vehicle and for moving the second section to a substantially vertical position, whereby the first and third sections are placed on two different levels separated by the substantially vertical second section.

4,081,092

TRACTOR WITH LIFTING MECHANISM FOR MOUNTING A BULLDOZER BLADE OR THE LIKE

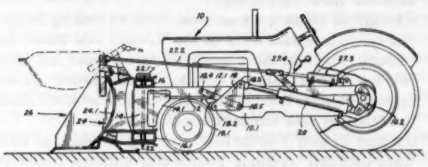
Emil F. Zimmerman, Richardton, N. Dak. 58652

Filed Oct. 17, 1975, Ser. No. 623,635

The portion of the term of this patent subsequent to Mar. 11, 1992, has been disclaimed.

Int. Cl.[2] E02F *3/72*

U.S. Cl. 214—131 R **9 Claims**



1. A tractor with a hydraulic lifting device extending forwardly therefrom and to which may be readily attached a bulldozer blade or the like, the lifting device including a pair of elongated lifting beams disposed longitudinally of the tractor on either side thereof and pivotally mounted at their rearward ends to the tractor frame, at least one transverse bar joining the lifting beams forwardly of the tractor, and hydraulic lifting means to pivot the beams upwardly and downwardly about their pivotal attachments to the frame between raised and lowered positions, the lifting means including, for each beam, an elongated pivot member pivotally mounted to the tractor frame intermediate the length of and adjacent the lifting beam, hydraulic means coupled to the pivot member at a first point spaced from the mounting of the pivot member to the frame and thereabove and oriented, when the lifting beams are in their rest positions, to urge the pivot member to pivot upwardly and forwardly of the tractor frame, and a beam strut pivotally connected at one end to the beam and at the other end to the pivot member at a second point spaced from the mounting of the pivot member to the frame, the first point of the pivot member being spaced further from the mounting thereof to the frame than is the second point, and the beam strut being so oriented with respect to the pivot member so as to make a generally forwardly open angle with a line passing between the mount of the pivot member to the frame and the second point of the pivot member, whereby as the pivot member is pivoted forwardly and upwardly, the lifting beams are urged upwardly.

4,081,093

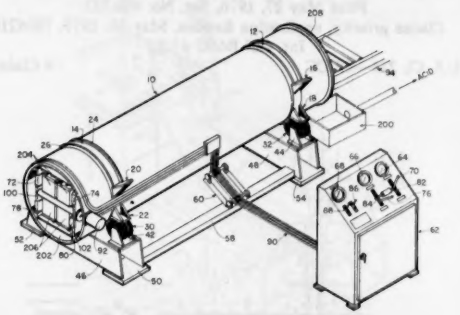
APPARATUS FOR DUMPING AND COLLECTING CORROSIVE SUBSTANCES FROM AUTOMOTIVE BATTERIES

William J. Eberle, Reading, Pa., assignor to General Battery Corporation, Reading, Pa.

Filed Mar. 22, 1976, Ser. No. 669,216

Int. Cl.[2] B65G *65/04*

U.S. Cl. 214—314 **15 Claims**



1. An acid dumping apparatus comprising,

a. an imperforate, substantially tubular member having openings at each of the opposing ends thereof for at least allowing the passage of storage batteries therethrough, said member having a substantially cylindrical exterior surface;

b. means for supporting said tubular member for rotation about its longitudinal axis, said means engaging the exterior surface of said member and further acting thereon to selectively rotate said member through predetermined arcs of rotation; and

c. means disposed within said tubular member for selectively gripping batteries introduced therein at least during the rotation of said member, said apparatus further comprising at least one substantially imperforate baffle extending longitudinally within said member, and means for supporting and acid-sealing said baffle with respect to at least two interior longitudinal surfaces of said tubular member, to form at least two longitudinal channels within said tubular member, at least the longitudinally extending sides of which channels are acid-sealed.

4,081,094

CONVEYOR-TRAILER FOR TRANSPORTING AN AGRICULTURAL COMMODITY

Ernest G. Pereira, San Jose, and Guy W. Fitch, Cupertino, both of Calif., assignors to Cotton Machinery Company, Inc., Livermore, Calif.

Filed Mar. 17, 1977, Ser. No. 778,702

Int. Cl.[2] B60P *1/38*

U.S. Cl. 214—355 **7 Claims**

1. Means for transporting agricultural commodities comprising:

a. a first frame;

b. a wheel for supporting said first frame for movement along a surface;

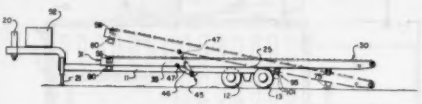
c. a conveyor frame supported by said first frame for pivotal movement;

d. means interconnecting said first frame and said conveyor frame for moving said conveyor frame between a horizontal position and an inclined position;

e. conveyor means carried by said conveyor frame for movement therewith and journalled by said conveyor frame for advancement relative to said conveyor frame;

f. independent power drive means for said conveyor means supported by said conveyor frame for movement therewith and connected to said conveyor means for advancing said conveyor means relative to said conveyor frame; and

g. a servo mechanism mounted on said conveyor frame for movement therewith and coupled to said independent power drive means for controlling the speed at which the independent power drive means operates said conveyor



means, said servo mechanism including a servo roller spaced from said wheel when said conveyor frame is in the horizontal position and disposed in engagement with said wheel to be rotated thereby when said conveyor frame is in the inclined position, said servo mechanism being responsive to the rotation of said servo roller for controlling the speed of operation of said independent power drive means to idle said conveyor means when said servo roller is spaced from said first wheel and to advance said conveyor means at a rate commensurate with and synchronous with the rotation of said wheel when said servo roller engages said wheel.

4,081,095

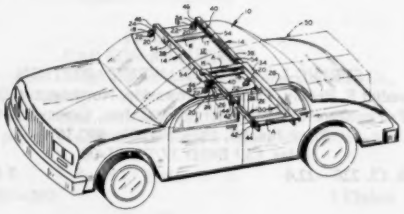
VEHICLE TOP ARTICLE CARRIER

Everett R. Wilburn, 1847 Princeton Dr., Toledo, Ohio 43614, and James C. Sorter, 6125 Windamar Rd., Toledo, Ohio 43611

Filed Mar. 25, 1977, Ser. No. 781,210

Int. Cl.[2] B60R *9/04*

U.S. Cl. 214—450 **3 Claims**



1. A vehicle top article carrier comprising:

a pair of spaced apart channel members adapted to span the substantial width of the verticle top, said channel members having a generally C-shaped cross-section;

means to suitably secure said channel members to the vehicle top;

article supporting rails having flanges depending therefrom;

an array of rollers connected to each of the flanges of said rails and adapted to be received within respective ones of said channel members to thereby provide for relative movement therebetween, each of said arrays including one roller of a larger diameter than the other rollers of said array;

detent means extending inwardly of each of said channel members to militate against the passage of the larger diameter roller of said array while permitting the passage of the other rollers of said array, registrable apertures in said channel members and said article supporting rails which are registrable by raising the article supporting rails, restraining means extending through said apertures when registered for removing the weight from the rollers and restraining motion of the article supporting rails relative to the channel members during transit.

4,081,096

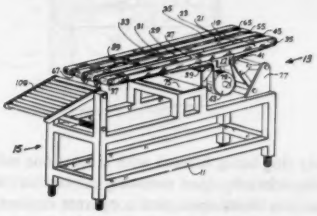
CANTILEVERED BELTED BAG LOADING METHOD

Vytautas Kupcikevicius, Chicago, Ill., assignor to Union Carbide Corporation, New York, N.Y.

Continuation of Ser. No. 637,863, Dec. 4, 1975, abandoned, which is a division of Ser. No. 345,933, Mar. 29, 1973, Pat. No. 3,942,624. This application Jul. 22, 1977, Ser. No. 818,293

Int. Cl.[2] B65B *5/04, 67/04*

U.S. Cl. 53—35 **3 Claims**



1. A continuous process for the successive bagging of individual articles of varying sizes and shapes, comprising the steps of;

a. providing a conveyor system having a proximal end, a cantilevered distal end and a multiplicity of spaced apart conveyors;

b. depositing a series of articles of varying sizes and shapes successively on the proximal end;

c. sequentially advancing the supported articles from the proximal end to the distal end during which each article advanced is supported by at least one of the spaced-apart conveyors;

d. providing a multiplicity of open mouth flexible packaging bags of assorted sizes and shapes adjacent the distal end of the conveyor system;

e. selecting, from said multiplicity of bags, a bag to accommodate the particular sized and shaped article at the distal end of the conveyor system;

f. placing the packaging bag selected over said article and at least a portion of the cantilevered distal end of the conveyor system;

g. advancing said article in said packaging bag until said article in said bag is clear of the conveyor system;

h. repeating the steps (e) through (g) for each new article in said series of articles, in each instance selecting a bag to accommodate to the size and shape of the article then advanced to the distal end of the conveyor system.

4,081,097

SAFETY CLOSURE FOR BOTTLES

Siegfried Dold, deceased, late of Rheinberg, Germany (by Hildegard Dold, heir), assignor to Underberg Gesellschaft mit beschrankter Haftung, Rheinberg, Germany

Filed Nov. 15, 1976, Ser. No. 741,761

Claims priority, application Germany, Nov. 18, 1975, 2551708

Int. Cl.[2] B65D *41/34*

U.S. Cl. 215—252 **15 Claims**

1. A safety closure and bottle combination, said bottle having a thread on the neck and a bead arranged thereunder, including

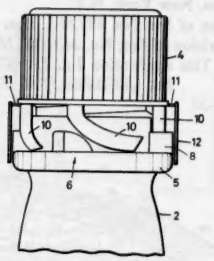
a screw cap adapted to be screwed on the thread on the neck of said bottle,

a safety ring disposed around said screw cap,

safety fracture stays breakably connecting said safety ring with said screw cap,

at least two teeth arranged offset relative to one another by a circumferential angle on the bead,

at least two break-open pins offset relative to one another by a circumferential angle, joined on a lower edge of said screw cap and adapted to operatively cooperate with said at least two teeth,



said safety ring being formed with at least one safety breaking area, whereby upon screwing off said screw cap, said at least two break-open pins cooperate respectively with said at least two teeth and cause said safety ring to break at said safety breaking area.

4,081,098

CONTAINER LID HAVING GRIPPING MEANS

Göran Lennart Daniel Johansson, Malmo, Sweden, assignor to Aktiebolaget Skane-Emballage, Malmo, Sweden

Filed Aug. 19, 1976, Ser. No. 716,013
Claims priority, application Sweden, Sep. 8, 1975, 7509945
Int. Cl.[2] B65D *41/04, 41/34*
U.S. Cl. 215—329 **3 Claims**

1. A screw-lid or deep-drawn rolled sheet metal comprising:

a circular main body;

a continuous circumferential flange formed integral with said main body and depending from the periphery thereof;

thread-engagement lugs formed by bent portions of the free edge of said flange; and

a plurality of circumferentially spaced finger-grips formed by indentations on said flange;

said spaced finger-grips being arranged in four equally spaced groups, the center points of said groups being oriented in four major directions, seen from the central axis of the lid, which major directions lie, two in the rolling direction of the rolled sheet metal of the lid and the other two at right angles thereto;

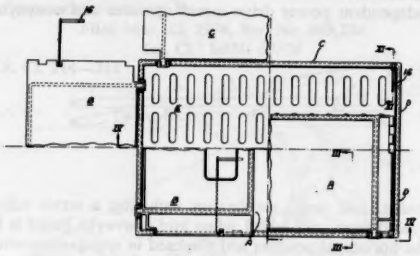
the spacing between every two adjacent finger-grips belonging to consecutive groups being greater than the spacing between adjacent finger-grips belonging to the same group.

4,081,099

COLLAPSIBLE CONTAINER

Terence H. C. Shead, Chorley Wood, England, assignor to Worldwide Plastics Development Limited, London, England

Filed Aug. 4, 1977, Ser. No. 821,864
Claims priority, application United Kingdom, Aug. 12, 1976, 33636/76
Int. Cl.[2] B65D *7/24, 5/20, 1/24, 1/48*
U.S. Cl. 220—6 **6 Claims**



1. A collapsible container having a base and sides moulded from a synthetic plastics material, said base and said sides including, at least partially encapsulated therein during moulding, elongate metal reinforcing elements, said reinforcing elements in said sides engaging with those in said base to provide integral hinges therebetween, and said container having interlock means at said hinges, said interlock means being adapted such that when, after initial moulding of said container base and sides in a generally flat condition, said sides are folded-up, said interlock means prevent return of said sides to said flat condition whereby said container may thereafter be collapsed only by folding said sides inwardly over said base.

4,081,100

SPRING-LOADED DRAWER PARTITION

Benedict F. Presby, Plainfield Township, Northampton County, Pa., assignor to Knoll International, Inc., Greenwich, Conn.

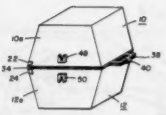
Filed Jun. 18, 1976, Ser. No. 697,367
Int. Cl.[2] B65D *57/00, 85/00*
U.S. Cl. 220—22.4 **7 Claims**

1. A spring-loaded drawer partition comprising a plate member adapted to slide along a side wall of a drawer and formed with an extension extending therefrom toward the inside of the drawer, a box member extending between the side walls of the drawer and having an open end thereof positioned adjacent said plate member and housing said extension on the inside thereof, and means yieldably biasing said box member and plate member away from each other to yieldably bias said plate member against said side wall.

4,081,101
DOUBLE FISHERMAN'S PAIL

Louis J. West, Rte. 1, Box 60-A, LaPorte City, Iowa 50651

Filed Jan. 19, 1977, Ser. No. 760,724
Int. Cl.[2] B65D *21/02;* A45C *13/00*
U.S. Cl. 220—23.4 7 Claims

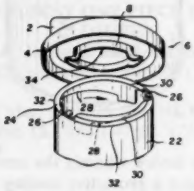


1. A fishermen's pail comprising: a pair of container portions and a pair of lid portions, the lid portions being associated with respective ones of the container portions to close over the same; the lid portions being hinged to their respective container portions for movement between open and closed positions relative thereto, one of the lid portions being provided with an aperture therein and means for retaining flexible bag forming material about said aperture and in the container portion associated with said one lid portion, the container portions being hinged to each other for movement between an open position in which the lid portions form adjacent work surfaces and a closed position in which one of the container portions is inverted upon the other with the lid portions in stacked position therebetween, each container portion having a base portion opposite its respective lid portion effective when both container portions are in their open position to engage and support said container portion in a stable position upon an underlying surface with its respective lid portion forming said work surface.

4,081,102
CAP FOR FUEL TANK

Yoshiharu Sakai, Atsugi, Japan, assignor to Nihon Radiator Co., Ltd., Tokyo, Japan

Filed Mar. 18, 1977, Ser. No. 778,850
Claims priority, application Japan, Mar. 25, 1976, 51-35187[U]
Int. Cl.[2] B65D *51/16*
U.S. Cl. 220—203 7 Claims



1. In a fuel tank cap comprising an inner plate having a locking peripheral skirt having bayonet-type projections projecting radially from its lower portion and adapted to engage complementary bayonet slots in a fuel inlet pipe, a cover plate fixed in overlapping relation to a surface of said inner plate, and an annular gasket mounted on the periphery of said inner plate, the improvement characterized in that the lower portion of said peripheral skirt is cut away between said projections to provide elongated recesses extending substantially from projection to projection, whereby said locking projections project both axially and radially from said skirt.

4,081,103
COVER FOR DRINKING CONTAINERS

Allen Peter Zoellick, 2300 N. Mayfair Rd., Milwaukee, Wis. 53226

Filed Mar. 26, 1976, Ser. No. 670,663
Int. Cl.[2] A47G *19/22;* B65D *41/48*
U.S. Cl. 220—254 8 Claims

1. A cover for a drinking container having a rim, said cover made from a resilient non-metallic material and comprising a peripheral rim section adapted to fit snugly over the rim of the container, and a resilient cover panel extending between the confines of said rim section to cover the container and having a main body, said cover panel also having a generally U-shaped weakening line defining a corresponding shaped flap having flat side margins extending along and in adjacently spaced relation from said U-shaped weakening line, said flap having an outer edge portion located near said rim section and bounded by said side margins, and said flap having an inner portion hingedly and integrally connected to said main body, a raised transverse reinforcing contour on said main body extending across the ends of said U-shaped weakening line and including a portion located adjacent the junction between said flap inner portion and said main body, and a raised reinforcing contour on said flap and having a portion located adjacent the junction between said flap inner portion and said main body in parallel relation to said portion of said reinforcing contour on said main body so as to define a resilient, stable transverse hinge axis for said flap extending between said parallel portions of said reinforcing contours, said flap being depressible relative to said main body to provide an opening for drinking from one side of the container by causing rupture of said U-shaped weakening line adjacent said outer edge portion and said side margins, said flap returning to a normal redepressible position where it substantially closes the opening upon being released from a depressed position in response to the resiliency of said hinge axis.

4,081,104
CONTAINER END MEMBER WITH AN INTEGRAL HINGED OPENING TAB HAVING INDENTATION THEREON

Paul Eugene Rising, Arvada; James Wendell Jensen, Boulder, both of Colo., and Harold Cook, Jr., Long View, Wash., assignors to Coors Container Company, Golden, Colo.

Filed May 25, 1977, Ser. No. 800,206
Int. Cl.[2] B65D *41/32*
U.S. Cl. 220—268 12 Claims

1. A container end member, or the like for sealed association with a container member to provide a sealed container, comprising:

a generally annular one piece sheet of material having a central axis;

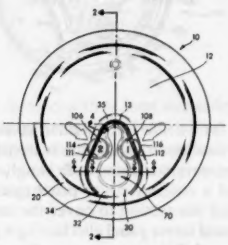
an outer annular rim portion for sealed association with the container body member;

a central end wall portion integrally connected to said rim portion and extending generally transversely relative to said central axis; and

a severable and displaceable tab portion in and integrally connected to said central end wall portion having:

an integral hinge portion having circumferentially spaced opposite ends and being located adjacent said outer annular rim portion and extending in generally circumferentially parallel closely spaced relationship relative thereto;

severable score groove means defining a severable wall portion for severing said tab portion from said central wall portion by axially inwardly directed forces, said score groove means and said severable wall portion extending from said opposite ends of said hinge portion generally radially inwardly relative to said outer annular rim portion toward said central axis and being located in part closely adjacent said central axis and defining a radially elongated and circumferentially extending tab portion area axially inwardly displaceable relative to said central end wall portion by pivotal movement about said hinge portion to provide an opening for the container having a vent portion adjacent said central axis and a pouring portion adjacent said rim portion; and



indentation means formed in said severable wall portion of said tab portion located in inwardly spaced relationship to said severable score groove means for strengthening and rigidifying said tab portion and for preventing outward deflection by internal pressure and for facilitating severance of the tab portion by fracture along the score groove means.

4,081,105

PEDAL BIN

Daniel Dagonnet, Amiens, and Gérard Chalmé, Bihorel-les Rouen, both of France, assignors to Societe Industrielle et Commerciale de Transformation des Plastiques "Sicopal", Douai, France

Filed Mar. 18, 1977, Ser. No. 779,148

Int. Cl.[2] B65D *43/26*

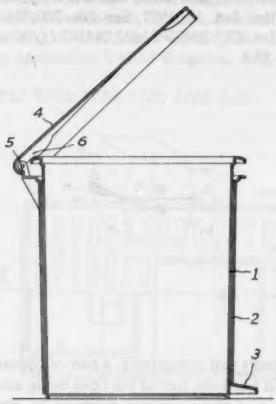
U.S. Cl. 220—263 **2 Claims**

1. A novel pedal bin, comprising:

a receptacle forming the actual bin;

base means associated with a lower portion of said receptacle for supporting said pedal bin relative to an underlying surface;

a jacket external of said receptacle and adapted to slide along the receptacle, relative movement of said jacket with respect to the receptacle being controlled by a pedal, said pedal being in force transmitting relationship with said jacket for lowering said jacket relative to said receptacle when said pedal is depressed, and



a lid hinged to said jacket.

4,081,106

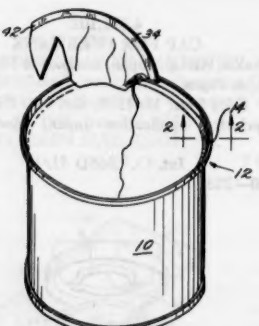
RESEALABLE CONTAINER DEVICE

Roland C. Gardner, Doylestown, Pa., assignor to Clevepak Corporation, New York, N.Y.

Filed Mar. 1, 1976, Ser. No. 662,686

Int. Cl.[2] B65D *41/00*

U.S. Cl. 220—359 **6 Claims**



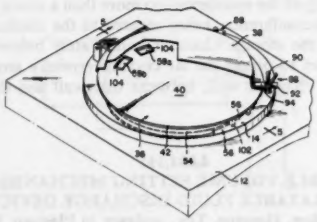
1. In a container device wherein the internal walls of the container device have a protective coating adhered thereon and a separate flexible protective end closure member removably adhered to one end portion of the device to provide an opening in the device when the closure member is removed, the improvement comprising:

a release coating adhered over the protective coating on the side opposite the internal walls of the container device, the end closure member being adhered to the release coating, so that removal of the end closure member leaves the protective coating intact and adhered to the inner walls of the container device, and at least part of said release coating is removed with said end closure member.

4,081,107
VENTING CLOSURE ASSEMBLY FOR MILK TANK OR THE LIKE

Timothy J. Martin, Jr., Lynden, and David C. Waschke, Everson, both of Wash., assignors to Light Industrial Design Co., Inc., Sumas, Wash.

Filed Mar. 7, 1977, Ser. No. 774,874
Int. Cl.[2] B65D *41/10*
U.S. Cl. 220—374 22 Claims



1. A closure assembly for a containing structure such as a milk tank, said containing structure defining a containing chamber to contain a liquid such as milk, the containing structure having an opening defined by a perimeter wall of a ring structure, said closure assembly comprising:

a. a venting closure member extending across said opening and having a central area and a perimeter area, said closure member being shaped to define:

1. a perimeter venting channel extending a substantial distance along the perimeter area of the closure member,
2. a first interior vent opening leading from said containing chamber to said venting channel at a first perimeter location,
3. a second exterior vent opening leading from the venting channel to an area exterior of said containing chamber, said second vent opening being at a second perimeter location spaced a substantial perimeter distance from said first location.

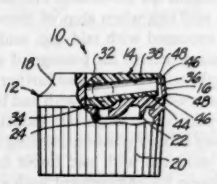
b. a vented cover member fitting over said venting closure member and having an outside vent opening communicating with said exterior vent opening of the venting closure member,

whereby the opening of the containing structure can be closed in a manner to contain said liquid securely without undue risk of contamination from outside sources, while providing a vent passage from the containing chamber to a location outside the closure assembly.

4,081,108
TAMPER EVIDENT ONE-PIECE DISPENSING CLOSURES

Woodrow S. Wilson, Johnston, and Robert E. Hazard, N. Kingstown, both of R.I., assignors to Polytop Corporation, Slatersville, R.I.

Filed Mar. 11, 1976, Ser. No. 665,728
Int. Cl.[2] B65D *47/08, 47/10*
U.S. Cl. 222—153 1 Claim



1. A dispensing closure having a cap and a spout, said spout having ends and a passage extending through said spout between said ends, said cap including a cap body, means for securing said cap to a container, said means being attached to said cap body and an opening extending through said cap body, said cap and said spout including co-acting means for rotatably mounting said spout for movement between an open position in which said spout extends from said cap body with said passage in alignment with said opening and a closed position in which contact between said spout and said cap body closes off said opening and in which a discharge end of said spout is located remote from said opening and said means for rotatably mounting said spout, in which the improvement comprises:

a flexible, rectilinear strap having parallel linear webs of material located at opposed ends of said strap, one of said webs being connected to an edge of the discharge end of said spout, the other of said webs being connected to said cap body,

said cap, said spout and said strap comprising a unitary article of a material capable of being temporarily deformed,

said webs being sufficiently thin so as to be capable of being easily severed and being sufficiently flexible so as to be capable of flexing along their lengths during assembly of said closure,

said co-acting means on said cap and said spout being capable of being assembled by being pushed together,

said strap being sufficiently long so as to permit said spout to be moved from a position in which said spout is spaced from and connected to said cap body to a position in which said co-acting means on said cap and said spout can be assembled together so as to permit said spout to be assembled on said cap body while said strap connects said spout and said cap body,

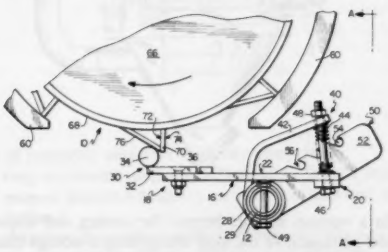
said strap being sufficiently short so that said spout cannot be moved after said spout is assembled on said cap body to said opened position from said closed position until said strap is severed,

said strap overlying and covering said discharge end of said spout and said passage when closure is assembled.

4,081,109
HAMMER SYSTEM FOR CEMENT METER

John L. Kugle, and Robert C. Futty, both of Lancaster, Pa., assignors to IRL Daffin Associates, Inc., Lancaster, Pa.

Filed Jun. 11, 1976, Ser. No. 695,025
Int. Cl.[2] B65G *65/70*
U.S. Cl. 222—197 4 Claims



1. A hammer system, for use in combination with a compartmented rotary metering drum having a cylindrical surface divided into arcuate portions by vanes having leading and trailing faces defining each metering compartment, comprising:

an elongated member having opposite end portions, a middle portion and a longitudinally extending axis,

bearing means supporting said elongated member at said opposite end portions;

lever means having a first end portion, a second end portion and a fulcrum point disposed therebetween;

said lever means comprising a U-shaped member including two rigid lever arms and a connecting member defining said second end portion;

mounting means secured to said lever means at said fulcrum point for rotatably mounting said lever means on said middle portion of said elongated member;

hammer means mounted on said first end portion of said lever means for imparting a hammer blow to the surface of the drum; and

biasing means operatively associated with said second end portion of said lever means constantly urging said lever means to rotate about said elongated member to force said hammer means towards the drum;

said biasing means being secured to said elongated member and comprising a stop means and a spring means, said spring means being held in constant compression between said stop means and said connecting member;

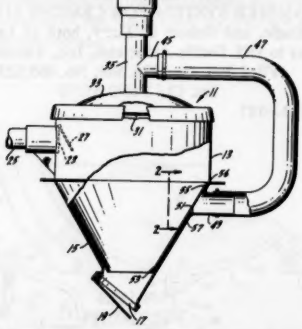
when the drum is rotated, the leading face of one vane forces said first end portion of said lever means away from the surface of the drum thereby rotating said lever means about said axis of said elongated member against the urging of said biasing means whereupon the vane passes said first end portion, said first end portion is suddenly released, and said biasing means forces said lever means to rotate about said fulcrum point causing said hammer means to strike the drum.

4,081,110

FLEXIBLE MEMBRANE DISCHARGE FOR VACUUM HOPPER

Arthur J. Evans, Northville, Mich., assignor to Whitlock, Inc., Farmington Hills, Mich.

Filed Jan. 3, 1977, Ser. No. 756,267
Int. Cl.² B65G 65/72
U.S. Cl. 222—203 **2 Claims**



1. In a vacuum storage hopper for storing and dispensing granular materials, of the kind comprising a storage chamber having a lower inverted conical discharge section terminating in a discharge valve, at least one material inlet and an air inlet-outlet in the upper part of the storage chamber, and vacuum-pressure means, connected to the air inlet-outlet, for exhausting air from the storage chamber to draw granular material thereinto and for supplying air under pressure to the storage chamber to assist the discharge of granular material from the hopper through the discharge valve, de-bridging means comprising:

a flexible, resilient, air-impervious membrane of inverted generally conical configuration having its upper edge sealed to the upper edge of the discharge section of the storage chamber and extending downwardly therein with the lower portion of the membrane hanging freely within the discharge section and having its free edge terminating a short distance above the discharge valve, and

membrane actuation means, including at least one air inlet port opening into the discharge section of the chamber, for introducing air under pressure between the wall of the storage chamber and the membrane to create a fluttering of the membrane,

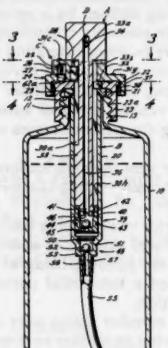
a short strip of the membrane, no more than a minor fraction of its circumference, being secured to the discharge section of the storage chamber immediately below the air inlet port to divert the air circumferentially around the storage chamber wall, between that wall and the membrane.

4,081,111

ADJUSTABLE VOLUME SETTING MECHANISM FOR REPEATABLE FLUID DISCHARGE DEVICE

Kiyoshi Sandow, Houston, Tex., assignor to Plasteco, Inc.

Filed Oct. 12, 1976, Ser. No. 731,205
Int. Cl.² G01F 11/06
U.S. Cl. 222—309 **12 Claims**



1. A fluid dispenser for dispensing selected predetermined volumes of fluid from a container, comprising:

barrel means for disposition into the container for receipt of fluid therefrom;

plunger means mounted in said barrel means and having a passageway therethrough for passage of fluid from said barrel upon movement of said plunger means with respect to the container;

said plunger means having a plurality of grooves of varying lengths formed thereon;

a cap for mounting said barrel means with the container, said cap having a plurality of position-locating recesses formed therein, said cap further having an opening formed therein for passage of said plunger means therethrough;

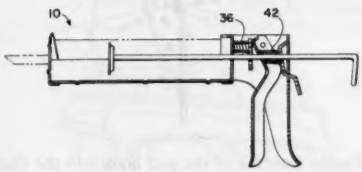
indexing pin means for movement into selected ones of said recesses in said cap when aligned therewith;

turret means mounted with said cap, said turret means having an opening therein for passage of said plunger means therethrough, said turret means further having said indexing pin means mounted therewith and being movable with respect to said cap to align said indexing pin means with selected ones of said position-locating recesses; and

guide means mounted with said turret means adjacent said opening therein for engagement with a selected groove in said plunger means according to the position of said indexing pin means in a selected one of said recesses in said cap, for limiting the amount of movement thereof to permit

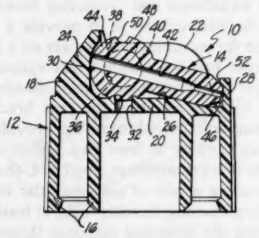
passage of a predetermined amount of fluid therethrough for dispensing from the container.

4,081,112
CAULKING GUN
Peter J.Y. Chang, 7700 Tremayne Pl., McLean, Va. 22101
Filed Oct. 12, 1976, Ser. No. 731,730
Int. Cl.² G01F *11/02*
U.S. Cl. 222—391 **5 Claims**



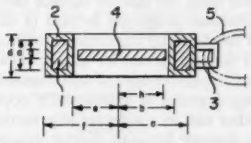
1. In a caulking gun having a frame, a plunger including a plunger shaft for forwardly urging caulking material, plunger driving means including: a handle, a trigger pivoted to the handle, a first grip and first spring, the first grip biased by the first spring and operable through the trigger for advancing the plunger, plunger-pressure retaining means including a second grip and second spring, the second grip biased by the second spring and having a portion operable for releasing plunger pressure, and the plunger having means thereon for manually retracting the plunger, the improvement comprising: the first grip encircling within the handle the plunger shaft and protruding upwardly beyond the plunger shaft to a location proximate the upper portion of the frame, the trigger extending upwardly in the handle to a trigger pivot located above the plunger shaft, a portion of the trigger above the pivot operatively contacting said first grip upward protrusion, said first spring oppositely biasing said trigger operative engagement, the handle having a forward wall, the first spring being a compression spring, and means for frictionally retaining the first spring in the spacing between the forward wall and the first grip, above the plunger shaft.

4,081,113
CHILD RESISTANT DISPENSING CLOSURE
Robert E. Hazard, N. Kingstown, R.I., assignor to Polytop Corporation, Slatersville, R.I.
Filed Mar. 11, 1976, Ser. No. 665,727
Int. Cl.² B65D *25/46, 47/06*
U.S. Cl. 222—534 **8 Claims**



1. In a dispensing closure having a cap and a spout,
said cap including mounting means adapted to be attached to a container, a cap body located on and connected to said mounting means, an elongated groove located within said body, means for rotatably supporting said spout located on said body so that said spout can be rotated about a substantially horizontal axis, an opening leading through said body from within said mounting means into said groove adjacent to a first end of said groove, said opening having a vertical axis intersecting said horizontal axis,
said spout being an elongated member having ends, a passage extending between said ends, said spout including means for rotatably supporting said spout located adjacent to a first of said ends, said means for rotatably supporting said spout and said body being in engagement with one another so as to mount said spout on said body so that said spout can be rotated about said horizontal axis between an opened and a closed position, end means located on said first end of said spout for engaging said body adjacent to and around the intersection of said opening and said body so as to make contact with and so as to form a seal between said opening and said spout at all times, said spout extending vertically with said passage in alignment with said opening in said opened position, said spout extending within said groove in said closed position, said groove and said spout being of such dimension that in said closed position said spout is incapable of being directly engaged by the hand of the user so as to be moved from said closed position toward said open position,
in which the improvement comprises:
said end means comprising an external surface of revolution having its axis coincident with said horizontal axis, and
engagement means for use in engaging said spout with a tool so as to rotate said spout from said closed position to a position in which said spout can be manually engaged so as to be manipulated to said open position
said engagement means being located in a position in said surface of revolution in which it is impossible to apply a vertically directed force to it to rotate said spout from said closed position,
said engagement means comprising a notch in said spout, said notch comprising an indentation in said spout extending inwardly of said surface of revolution.

4,081,114
MAGNETIC SUPPORTER ASSEMBLY
Mitio Inoue, Tokyo, Japan, assignor to TDK Electronics Company, Limited, Tokyo, Japan
Filed Oct. 2, 1975, Ser. No. 618,845
Claims priority, application Japan, Oct. 3, 1974, 49-119469[U]
Int. Cl.² A45F *5/00*
U.S. Cl. 224—5 C **1 Claim**



1. A magnetic supporter assembly comprising:
a ring permanent magnet magnetized to form a multipolar magnet having a height *a*, an inner radius *b* and an outer radius *c*,
a protective material completely enveloping the ring permanent magnet to form a hollow ring of height *d*, inner radius *e* and outer radius *f*,
inner radius *b* of the ring permanent magnet being larger than inner radius *e* of the protective material, outer radius *c* of the ring permanent magnet being less than outer radius *f* of the protective material and height *a* of the ring permanent magnet being less than height *d* of the protective material,
a supporting element having an opening therein affixed to the outer periphery of the protective material,
a magnetic mark piece in the shape of a right cylinder having

a height *g* and a radius *h* adapted to be suspended and magnetically radially held in the space within the ring permanent magnet,

the radius *h* of the magnetic mark piece being less than the inner radius *e* of the protective material to form a gap therebetween,

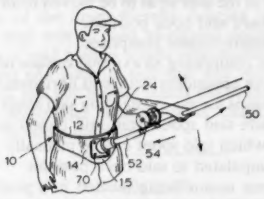
the height *g* of the magnetic mark piece being less than the height *a* of the ring permanent magnet.

4,081,115

FISHING ROD SUPPORT BELT

Billy H. White, 4374 Lantern Dr., and William R. Griffin, 2220 Garden St., both of Titusville, Fla. 32780, assignors to Billy H. White; William R. Griffin and Stanley R. Andrews, all of Titusville, Fla.

Filed Jan. 5, 1976, Ser. No. 646,606
Int. Cl.² A45F *5/00*
U.S. Cl. 224—5 E **13 Claims**



1. A support belt for engaging the handle end of a fishing rod, comprising in combination:

a waist-engaging member of a self-supportive resilient material having a front surface and arms couple thereto for engaging the waist of a wearer;

engaging means coupled to said front surface of said waist-engaging member, said engaging means comprising a receptacle;

movable coupling means disposed between said receptacle and said front of said waist-engaging member, said movable coupling means comprising a substantially spherical socket and a ball movably disposed within said socket; and

said support belt further comprising rotating limiting means including two node elements integrally disposed in spaced apart relation to one another on the interior of said socket and projecting inwardly substantially toward the center of said socket from the interior surface thereof, at least two spaced channels integrally formed in said ball and each having a substantially curvilinear, longitudinal configuration, said nodes disposed for sliding engagement with the interior of respective ones of said channels, said tow channels being disposed in substantially coplanar relation to one another and in a substantially vertical plane, one of said two channels having a shorter longitudinal dimension than the other of said channels, said shorter channel disposed to prevent elevation of the fishing rod below a perpendicular to the abdomen of the wearer, whereby rotation of the fishing rod about a longitudinal axis is prohibited.

4,081,116

GAFF HOOK HOLDER

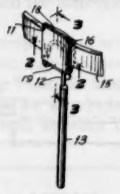
Ronald Fliegelman, deceased, late of Bronx, N.Y., and by Helen Fliegelman, administratrix, 2745 Gifford Ave., Bronx, N.Y. 10465

Filed Nov. 3, 1976, Ser. No. 738,786
Int. Cl.² A45F *5/00*
U.S. Cl. 224—5 A **3 Claims**

1. A gaff hook holder for receiving the hook portion of a gaff hook comprising:

a substantially flat housing comprising a first flat plate and a second chamber plate having a semicircular chamber formed therein for receiving the hook portion of the gaff hook, the diameter of said semicircular chamber being slightly larger than the outer periphery of the hook, the width of the chamber being slightly greater than the thickness of the hook;

detent means formed within said chamber for reducing the thickness of the chamber with respect to the gaff hook so



that upon insertion of the gaff hook into the chamber it passes over the detent for securement in place against the semicircular walls of the chamber housing;

belt loops which are parallel and spaced apart and formed on the sides of the holder for receiving a belt or strap; and

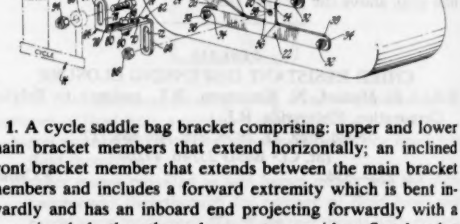
means for securing the flat plate, said second plate having the semicircular chamber, and said belt loops together.

4,081,117

SADDLE BAG BRACKET

Dale Everett Crane, Venice, Calif., assignor to Lear Siegler, Inc., Mendon, Mich.

Filed Nov. 26, 1976, Ser. No. 745,267
Int. Cl.² B62J *11/00*
U.S. Cl. 224—39 **4 Claims**

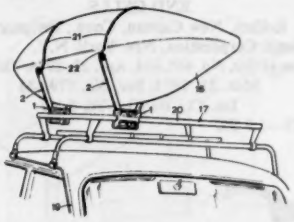


1. A cycle saddle bag bracket comprising: upper and lower main bracket members that extend horizontally; an inclined front bracket member that extends between the main bracket members and includes a forward extremity which is bent inwardly and has an inboard end projecting forwardly with a mounting hole therethrough so as to provide a first bracket mounting portion for mounting the bracket on a first location on a cycle; a rear bracket member that extends vertically between the upper and lower main bracket members rearward of the inclined bracket member; the rear bracket member having a mounting hole therethrough for providing a second bracket mounting portion; at least two additional mounting holes through the bracket members; a pair of L-shaped mounts; each mount including a pair of perpendicular legs; each leg having a mounting opening therethrough; at least two of said mount legs having the mounting openings thereof formed to provide adjustable connections therealong; nut and bolt sets for adjustably securing first legs of the mounts to each other and for adjustably securing the second leg of one mount to a second location on the cycle spaced from the first location; cooperable nut and bolt sets for securing the bracket to a saddle bag with the bolts extending through associated bracket mounting holes; and another nut and bolt set securing the bracket to the saddle bag and the second leg of the other mount to the bracket with the bolt thereof extending through the mounting hole of the rear bracket member.

4,081,118
CARRIER FOR USE IN SUPPORTING A CANOE OR OTHER ELONGATE ARTICLE ON A VEHICLE ROOF

Robert Alan Mason, 11 Forest Ave., Essington, near Wolverhampton, England (WV11 2AJ)

Filed Apr. 23, 1976, Ser. No. 679,655
Claims priority, application United Kingdom, Apr. 23, 1975, 16723/75
Int. Cl.² B60R 9/04
U.S. Cl. 224—42.1 G 6 Claims

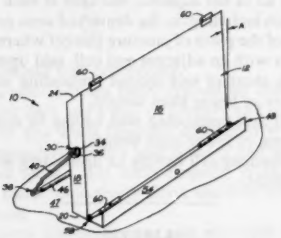


1. A carrier for use in supporting a canoe or other elongate article on a vehicle roof, comprising a base constructed and arranged for mounting the carrier on a vehicle roof rack, and a pair of elongated limbs which extend upwardly divergently from said base in laterally spaced relationship and in combination define a cradle for supporting the canoe or other article, said base comprising two similar base members each of which has one of said limbs integral therewith and is of rectangular, substantially plate-like, form with said one limb projecting obliquely from a side edge thereof and having a channel portion extending transversely relative to the longitudinal axis of said limb, said base members being disposed face-to-face with their channel portions oppositely disposed to define together an elongated clamping socket in said base which is able to receive a structural member of a vehicle roof rack, and said base members being relatively adjustable lengthwise of said clamping socket to vary the lateral spacing of said limbs and thereby the width of said cradle, and clamping means on said base members which releasably secure said base members together.

4,081,119
CARRYING CASE

Robert L. Messmore, 1520 N. Pierson Rd., Peoria, Ill. 61604

Filed Jul. 13, 1976, Ser. No. 704,827
Int. Cl.² B65D 71/00
U.S. Cl. 224—46 R 6 Claims



1. A carrying case comprising:

an upwardly opening box having a bottom, a first pair of facing walls connected rigidly to said bottom, a second pair of facing walls connected rigidly to said bottom, a top edge, and a bottom edge;

a removable member;

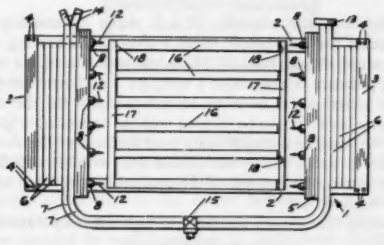
first means for releasably connecting said removable member to said box substantially at said top edge, said removable member being of a construction sufficient for serving as a cover to said box thereat, said first means including first and second hinge elements and a hinge pin, said first hinge element being connected to said removable member, said second hinge element being connected to said box substantially at said top edge, said hinge pin being of a construction sufficient for pivotally interconnecting said first and second hinge elements;

second means for releasably connecting said removable member to said box substantially at said bottom edge, said removable member being of a construction sufficient for serving as a tray thereat, said second means including a third hinge element connected to said box substantially at said bottom edge, said hinge pin being of a construction sufficient for pivotally interconnecting said first and third hinge elements.

4,081,120
BUILDING PRESS

Archie C. Epes, 1705 Audubon Pl., Shreveport, La. 71105

Filed May 17, 1976, Ser. No. 687,022
Int. Cl.² B27F 7/02
U.S. Cl. 227—113 7 Claims



1. A building press for joining building components comprising:

(a) a frame adapted to receive building components in a selected configuration;

(b) at least one hammer disposed in movable cooperation with said frame;

(c) a plurality of magnets magnetically carried by said hammer for selectively positioning fasteners on said hammer; and

(d) pressure means in cooperation with said frame and said hammer to effect movement of said hammer with respect to said frame to force said fasteners into said building components and join said building components in said selected configuration with a single movement of said hammer.

4,081,121
METHOD OF HIGH TEMPERATURE ASSEMBLY

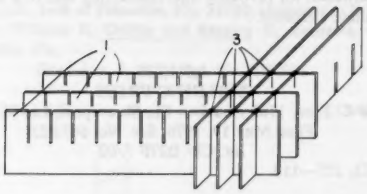
Paul Picard, Romans, France, assignor to C.E.R.C.A., Compagnie pour l'Etude et la Realisation de Combustibles Atomiques, Paris, France

Filed Dec. 9, 1975, Ser. No. 639,202
Claims priority, application France, Dec. 13, 1974, 74 41937
Int. Cl.² B23K 1/04
U.S. Cl. 228—181 9 Claims

1. In a fluxless method of high-temperature assembly or brazing, of similar or different, metallic, nonmetallic or partially metallic components by means of bonding with an added metal or alloy with a melting point below that of the most fusible component without mechanical or chemical preparation of the surfaces of the components at the areas to be bonded to remove oxide contaminants, the improvement comprising effecting assembly by the successive steps of:

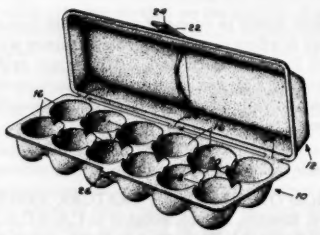
a. positioning the components in an assembled relationship with the metal or alloy to be added immediately adjacent areas of the components where bonds are to be formed;

b. positioning the assembly of (a) in a chamber and establishing a residual pressure of below about 1 torr;
c. heating the assembly of (b), while maintaining the residual pressure below about 1 torr, to brazing temperature at least equal to a temperature required to melt the added metal or alloy in the presence of one or more halogens derived from one or more halogens in a free or combined state utilized in a manner so as to only exert a partial pressure that does not interfere with maintaining said residual pressure below about 1 torr to eliminate any surface film of oxide on the components to be bonded;



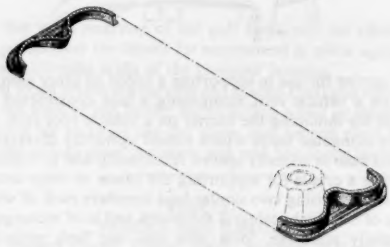
d. subjecting the assembly of (c), while maintaining the residual pressure below about 1 torr, to the brazing temperature, above about 800° C, while maintaining the residual pressure below about 1 torr, for a sufficient time for the added metal or alloy to substantially fill the areas where bonds are to be formed without appreciable spread of the bonding metal or alloy over surfaces of the components in areas not to be bonded and without significant halogen contamination of the components in areas not to be bonded; and
e. cooling the bonded assembly to ambient temperature.

4,081,122
COMBINED ICE TRAY EGG CARTON
John S. Hobson, 64 Upper Mountain Ave., Montclair, N.J. 07042
Filed Aug. 12, 1976, Ser. No. 713,839
Int. Cl.[2] B65D *1/00*
U.S. Cl. 229—2.5 EC **2 Claims**



1. A container comprising:
a flexible water impervious rectangular base portion having a plurality of ovoid cavities and curved walls of substantially uniform depth separating adjacent cavities to form two parallel rows of six cavities adapted to receive one dozen eggs;
each cavity including a plurality of tapered channels in the upper edges of said walls positioned in said curved walls at the closest spacing between adjacent cavities communicating with adjacent cavities; said channels being in the form of v-shaped slots, the sides of said slots being tapered at an angle of between 45° and 120°, the full cross section of said slots including the sharp lower tips extending completely through said walls into said adjacent cavities, said cavities being adapted to receive water to be frozen to ovoid shaped ice cubes and said slots being adapted to direct water between adjacent cavities and providing stress points for separation and removal of said ice cubes;
a cover movably secured along one edge of said base; and,
locking means disposed on said cover and said base disposed on the edge of said base and cover opposite the edge of said cover movably secured to said base.

4,081,123
DUAL BASIS WEIGHT MULTI-WALLED EGG CARTON END CELLS
Richard F. Reifers, New Canaan, Conn., assignor to Diamond International Corporation, New York, N.Y.
Continuation of Ser. No. 465,434, Apr. 29, 1974. This application Mar. 21, 1977, Ser. No. 779,634
Int. Cl.[2] B65D *1/36, 5/66*
U.S. Cl. 229—2.5 EC **1 Claim**

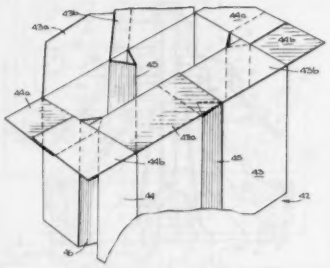


1. In a molded egg carton having a hinged flap at one long side and a hinged cover at a second long side and two short hinge-free ends and provided with a lower multi-row cellular tray comprising a plurality of cells including two sets of end cells at each of said two short ends and intermediate cells along the carton long sides between said sets of end cells,
said end cells being different from said intermediate cells in that each of said end cells has a demarked area of higher basis weight and the corresponding areas of the intermediate cells are of lower basis weight,
each of said end cells and each of said intermediate cells having generally upstanding walls with each end cell having a first upstanding wall and a second upstanding wall,
said first upstanding end cell walls including all of said demarked area which is in the shape of an upstanding band below the top of said tray and discretely spaced from the tray bottom, said band, like a belt, extending continuously and unbrokenly across and about said first upstanding walls of all of the adjacent end cells at each short end of the carton including, in the demarked area, only the upper portion of the place of juncture thereof where one end cell connects with an adjacent end cell, said upstanding band stopping short of said second upstanding end cell walls which are of lower basis weight,
each end cell first upstanding wall having its area, below the demarked area, of lower basis weight,
each intermediate cell having its upstanding walls of lower basis weight.

4,081,124
CARTON WALL WITH REINFORCING RIB
David Y. Hall, Sharon, Conn., assignor to Indian Head, Inc., New York, N.Y.
Filed Jul. 12, 1976, Ser. No. 704,637
Int. Cl.[2] B65D *5/12*
U.S. Cl. 229—23 BT **7 Claims**

1. A folding paper board container comprising a bottom and a sidewall structure having a plurality of hingedly interconnected sidewall panels, said sidewall structure when erected being mounted on and forming an enclosure overlaying said bottom, at least two of said plurality of sidewall panels having

integral, collapsible, vertically extending reinforcing means projecting inwardly with respect to said enclosure beyond the inner surface of said sidewall panel when said container is erected, said container including said reinforcing means being operative to be folded into a substantially flat structure and expanded to erect said container and form said enclosure, said container further comprising means for maintaining said sidewall structure expanded comprising a plurality of flaps, each of



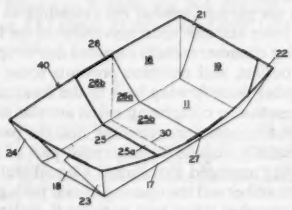
said flaps being hingedly secured to one end of a respective sidewall panel having said reinforcing means and being slotted adjacent said reinforcing means, each of said flaps being operative to be folded at a substantially right angle to a respective sidewall panel and portions of each of said flaps being separated by slotting for overlaying and securing the separated portions, whereby said sidewall structure may be maintained in expanded form.

4,081,125

PARTITIONED TRAY

George L. Meyers, Menasha, Wis., assignor to American Can Company, Greenwich, Conn.

Filed May 12, 1977, Ser. No. 796,220
Int. Cl.[2] B65D *5/20, 3/24*
U.S. Cl. 229—31 R **2 Claims**



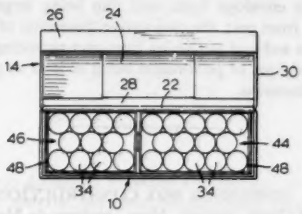
1. A paperboard tray comprising:
a. a rectangular bottom panel defined by first and second side score lines and a pair of primary end score lines;
b. a pair of end walls hingedly connected to said bottom panel respectively along said primary end score lines;
c. first and second side walls hingedly connected to said bottom panel respectively along said first and second side score lines;
d. four corner tabs connecting said end walls and said side walls together to form a tray body;
e. a first divider panel having a main portion overlaying said bottom panel and having a pair of end portions respectively overlaying said end walls and being hingedly connected to said main portion along a pair of secondary end score lines which respectively overlay said pair of primary end score lines;
f. the main portion of said first divider panel having an attachment section defined by said pair of secondary end score lines and a fold line and having a partition section hingedly connected to said attachment section along said fold line, said attachment section being adhered to said bottom panel; and
g. the end portions of said first divider panel having a pair of biased fold lines dividing the end portions into substantially triangular web sections and end glue sections, said end glue sections being respectively adhered to said end walls.

4,081,126

DUAL-BUNDLE CIGARETTE PACKAGING STRUCTURE

Edward G. Barnard, Toronto, Canada, assignor to Peter Stuyvesant of Canada, Limited, Toronto, Canada

Filed Jun. 7, 1976, Ser. No. 693,186
Claims priority, application Canada, Jun. 17, 1975, 229494
Int. Cl.[2] B65D *5/66, 75/40*
U.S. Cl. 229—44 CB **4 Claims**



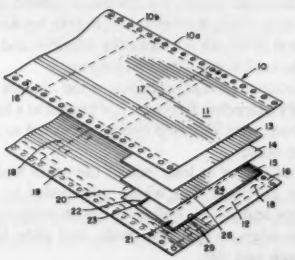
1. A flip-top cigarette packaging structure containing 25 cigarettes comprising a parallelopiped container consisting of a lower cigarette-retaining portion and an upper closure portion hingedly connected to the lower portion for opening and closing said container, two laterally-confined bundles of cigarettes located in said container in juxtaposed position and separated from one another, each of said bundles consisting of three parallel rows of cigarettes in which the outer rows contain one more cigarette than the middle row and each member of the middle row engages two members of each of the outer rows, the respective row of each bundle being in straight-line alignment with each other, one of said bundles containing 14 cigarettes and the other of said bundles containing 11 cigarettes.

4,081,127

RETURN ENVELOPE FOR MAILER AND METHOD

Donald J. Steidinger, Barrington, Ill., assignor to Wallace Business Forms, Inc., Hillside, Ill.

Filed Jun. 15, 1976, Ser. No. 696,352
Int. Cl.[2] B65D *27/10*
U.S. Cl. 229—69 **9 Claims**



1. In combination, a series of connected stuffed, sealed envelope assemblies separated by transverse lines of perforation, each assembly having a top and bottom ply and a plurality of smaller intermediate plies, each assembly having a predetermined interior dimension extending perpendicular to said lines of perforation, certain of said intermediate plies constituting a

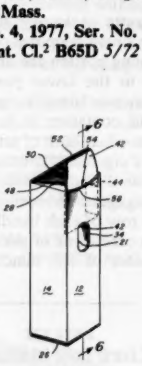
return envelope, each return envelope comprising: a generally rectangular first ply portion forming the return envelope back, a generally rectangular second ply portion forming only a part of the return envelope front and united to said first ply portion along three sides to provide an envelope pocket, a generally rectangular third ply portion forming the remaining part of said return envelope front and also the flap of said return envelope, said flap being equipped with adhesive for securing the same to said return envelope back, means connecting said second and third ply portions with said third ply portion overlying said second ply portion when said return envelope is in a first condition as part of a mailer, and a line of potential folding in said third ply portion between said remaining front part of said flap to permit said return envelope to be folded along said line of potential folding wherein said flap contacts said envelope back for said envelope to assume a second condition wherein it is adapted to confine a check or the like larger than said return envelope back, said flap being larger than said remaining front part, the cumulative dimension of said second ply portion and said remaining front part extending perpendicular to said lines of perforation being at least as great as said interior dimension.

4,081,128

DISPENSER BOX CONSTRUCTION

James L. O'Neill, Norfolk, Mass., assignor to Merkert Enterprises, Inc., Canton, Mass.

Filed Feb. 4, 1977, Ser. No. 765,816
Int. Cl.[2] B65D *5/72*
U.S. Cl. 229—17 SC **7 Claims**



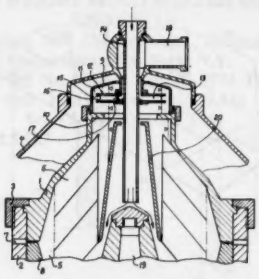
1. A slide closure container comprising:
a plurality of outer walls folded along parallel fold lines and including a front wall having a window formed therein;
a bottom closure;
a slide disposed within the container behind the front wall, said slide being movable heightwise between a lowered position in which it blocks the window and a raised position in which the window is open;
said container further including a top closure having a forwardly extending flap which is hinged at a location behind the front wall, said flap being connected to the upper end of the slide;
the upper end of at least one of the other walls of the container having a flap which cooperates to form the top closure and which defines a slot in cooperation with the upper edge of the front wall, said slide being slideable through said slot;
said slide including a transversely extending minor portion, folded with respect to the main portion of the slide so that the minor portion will lie against the next adjacent container wall and will fit within the corner defined by said next adjacent container wall and the front wall; and
said container being formed in its entirety from a single, one piece blank.

4,081,129

CENTRIFUGE WITH PERIPHERAL OUTLETS AND STATIONARY PARING DEVICE

Klaus H. D. Stroucken, Ronninge, Sweden, assignor to Alfa-Laval AB, Tumba, Sweden

Filed Aug. 27, 1976, Ser. No. 718,388
Claims priority, application Sweden, Aug. 17, 1975, 75103861
Int. Cl.[2] B04B *1/14, 15/08*
U.S. Cl. 233—20 R **7 Claims**



1. In combination with a centrifugal separator including a rotor forming a separating chamber and having a central inlet for a mixture to be centrifuged, the rotor also having normally closed peripheral outlets adapted to be opened intermittently during rotation of the rotor to effect intermittent discharge of a separated heavy component from the separating chamber, the rotor also forming a paring chamber located near the rotor axis and communicating with the separating chamber, and stationary paring means extending into the paring chamber and having a paring channel for discharging liquid separated from said mixture, an arrangement for preventing air from passing into said paring channel when the liquid level within the rotor moves radially outward due to opening of said peripheral outlets, said arrangement comprising an annular partition connected with the rotor and located between the separating chamber and the paring chamber, said partition allowing liquid flow, during normal operation of the rotor, from the separating chamber to the paring chamber but extending so far inwardly toward the rotor axis that upon movement of the liquid level in the separating chamber radially outward due to opening of said peripheral outlets, said partition prevents some liquid in the paring chamber from flowing back to the separating chamber, said arrangement also comprising a first annular stationary disc coaxial with the rotor and extending into the paring chamber to a level radially outside the innermost part of the partition, said disc being arranged to maintain a liquid seal between the separating chamber and the opening of said paring channel into the paring chamber when said peripheral outlets are opened during rotation of the rotor, and means including a second annular stationary disc operable during rotation of the rotor to form a liquid seal between said opening of the paring channel and the atmosphere surrounding the rotor, there being a gas-venting passage between the interior of the rotor and the surrounding atmosphere, said passage affording unobstructed flow of air in both directions through the passage.

4,081,130

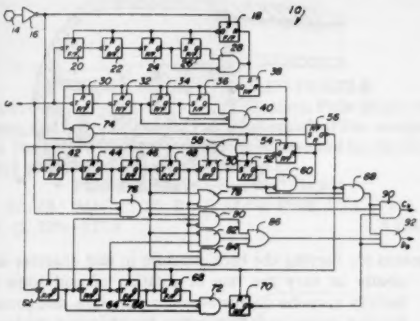
FILTER-TYPE PULSE DETECTION MEANS

Duane Ridgely Bolgiano, Bala Cynwyd, Pa., assignor to International Mobile Machines Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 626,021, Oct. 28, 1975, Pat. No. 4,006,316, which is a continuation-in-part of Ser. No. 496,450, Aug. 12, 1974, Pat. No. 3,936,617. This application Aug. 17, 1976, Ser. No. 715,065
Int. Cl.[2] H03K *21/06;* G01R *23/02*
U.S. Cl. 235—92 PB **6 Claims**

1. A filter-type pulse counter system which separates pulses of a predetermined frequency from other pulses transmitted

from a source of said pulses, filters out said other pulses, and then accepts and counts those pulses of said predetermined frequency which occur during a predetermined time interval, said counter system comprising first and second pulse counters arranged in cascade to receive signal pulses from a source thereof, a source of clock pulses connected to said cascaded pulse counters to apply clock pulses thereto, said cascaded



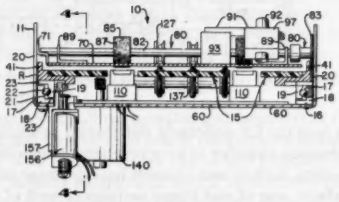
pulse counters being enabled by said signal pulses to count said clock pulses, an acceptance gate connected to and controlled by said cascaded counters and to said source of signal pulses, said acceptance gate being adapted to accept only those signal pulses where the duration between the start of each successive pulse lies beteeen predetermined limits as determined by the cascaded counter, and a third counter connected to said acceptance gate to receive and count the accepted signal pulses.

4,081,131

TRAY ACCEPTOR APPARATUS

Edward Charles Sand, Willoughby, and Harold C. Lightner, Kirtland, both of Ohio, assignors to Ardac, Inc., Willoughby, Ohio

Filed Apr. 7, 1976, Ser. No. 674,578
Int. Cl.[2] G06K *13/00, 7/08;* **G07F** *1/06*
U.S. Cl. 235—419 **20 Claims**



1. A tray acceptor apparatus, comprising,

a housing, a tray mounted on said housing, and at least one auxiliary plate, said auxiliary plate mounted on said housing parallel to said tray,

of said tray having a rack thereon, one of said plates having a drive shaft, said rack engaging said drive shaft,

said drive shaft having a gear, said gear engaging said rack so that a mechanical engagement between said rack and said drive shaft is formed,

said drive shaft having at least one compliant roller thereon, said compliant roller having a resilient covering thereon, and

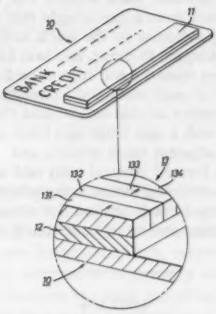
wherein the radius of the contact surface of said compliant roller with said tray is the same as the pitch radius of said gear so that said tray and said roller moves at the same speed.

4,081,132

CREDIT CARDS AND OTHER SECURITY DOCUMENTS

Ralph Reginald Pearce, West Drayton, England, assignor to E M I Limited, Middlesex, England

Filed Oct. 22, 1974, Ser. No. 516,988
Claims priority, application United Kingdom, Oct. 23, 1973, 49272/73
Int. Cl.[2] G06K *19/06, 7/08;* **B44D** *1/02*
U.S. Cl. 235—493 **10 Claims**



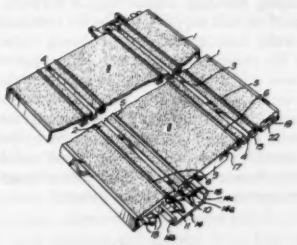
1. A security document including a carrier and two layers of magnetisable material, one overlying the other, the carrier and the layers being bonded together, and the layers being an information record layer and a verification pattern record layer in which verification layer magnetic material in different parts of the layer is fixedly physically structured into a pattern of a magnetic property and in which the material of the verification layer is a metal or an alloy and has a Curie temperature below that of the material of the information layer.

4,081,133

TOY TRACK SECTION WITH ELECTRICAL CONNECTOR SAFETY MEANS

Duncan Tong, Hong Kong, Hong Kong, assignor to Playart Limited, Hong Kong

Filed Jul. 14, 1976, Ser. No. 705,094
Claims priority, application United Kingdom, Jul. 16, 1975, 29944/75
Int. Cl.[2] A63H *19/30*
U.S. Cl. 238—10 F **9 Claims**



1. A toy track for use with electrically operated self-propelled toys such as vehicles or railway trains, said toy track including a plurality of track section, each track section comprising

a pair of electrically conductive rails extending substantially the length of said track section, said rails being mounted on a base,

electrical connection members connected to one end of said conductive rails, at least one of said electrical connection members extending beyond the end edge of said base, and said electrical connector members being adapted to join

with a pair of electrically conductive rails on an adjacent track section,

a safety projection member connected to said track section closely adjacent said electrical connector member, said safety projection member being comrised of a base wall and opposed side walls only with the electrical connector member positioned between the side walls, that structure of said projection member exposing said electrical connection members to view when said track section is unconnected to an adjacent track section and when said track section is viewed from a line of sight that permits viewing of and is perpendicular to the track surface over which said toys are adapted to move, and said base wall and side walls extending from the end edge of said base beyond the exposed end of said electrical connection member for preventing contact of that end of said electrical connection member with a user when said track section is unconnected to an adjacent track section, and

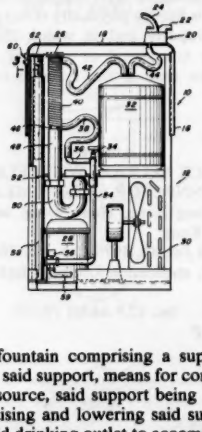
retaining means formed integral with said safety projection member, said retaining means being adapted to cooperate with an adjacent track section for connecting together said track section and an adjacent track section in operative relation.

4,081,134

VERTICALLY ADJUSTABLE DRINKING FOUNTAIN

Henry G. Anderson, Box 21, Falls Church, Va. 22046

Filed Jun. 3, 1976, Ser. No. 692,249
Int. Cl.² E03B *9/20*
U.S. Cl. 239—30 **6 Claims**



1. A drinking fountain comprising a support, a drinking outlet mounted on said support, means for communicating said outlet to a water source, said support being vertically adjustable, means for raising and lowering said support to thereby raise and lower said drinking outlet to accommodate the needs of various users, said means for raising and lowering comprising a fluid actuated piston and cylinder arrangement operably associated with said support, said piston and cylinder arrangement connected to the water source, and valve means for selectively communicating said water source to said piston and cylinder arrangement for actuation thereof.

4,081,135

PULSATING SHOWER HEAD

Patrick M. Tomaro, Maplewood, N.J., assignor to Conair Corporation, Edison, N.J.

Filed Jun. 11, 1976, Ser. No. 695,140
Int. Cl.² B05B *1/08*
U.S. Cl. 239—102 **8 Claims**

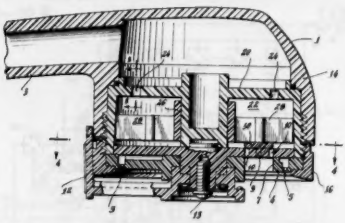
1. A shower head for producing water sprays with varying degrees of pulsation including

a shower head housing,

a chamber within said housing, said chamber having a chamber water inlet and a chamber water outlet,

a rotor mounted for rotation within said chamber, said rotor including turbine blades to cause rotation of same, said blades being positioned to receive water entering said chamber through said chamber inlet,

said rotor including a chopping vane positioned so as to cut all water leaving said chamber through said chamber outlet to create pulsation of the water, and



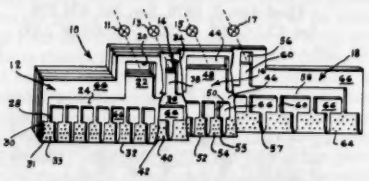
means for varying the back pressure in said chamber sufficiently to vary the rate of rotation of said rotor and thereby vary the degree of water pulsation, said pressure varying means including means for changing the size of said chamber inlet relative to said chamber outlet and means for providing a more tortuous path for the water passing through said chamber outlet when said shower head is set for a steady-state stream.

4,081,136

DUAL MANIFOLD HIGH PERFORMANCE THROTTLEABLE INJECTOR

John F. Addoms, Penryn, Calif., and Charles B. McGough, Bonn-bad Godesberg, Germany, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jan. 21, 1977, Ser. No. 761,508
Int. Cl.² F02K *9/02*
U.S. Cl. 239—127.1 **10 Claims**



1. An injector for uniformly distributing propellant within the combustion chamber of a rocket engine comprising at least four platelets, each of said platelets having planar surfaces and edge surfaces, one of said planar surfaces of each of said platelets containing a plurality of flow passages therein, said flow passages terminating at said edge surface in an opening in said edge surface, said platelets being joined together in a stack to form a unitary structure, the first of said platelets having means therein adapted to receive a predetermined quantity of fuel, the second of said platelets having means therein adapted to receive less than said predetermined quantity of fuel, the third of said platelets having means therein adapted to receive a predetermined quantity of oxidizer, the fourth of said platelets adapted to receive less than said predetermined quantity of oxidizer, each of said first and second platelets having means therein for operatively connecting said fuel receiving means to said flow passages, each of said third and fourth platelets having means therein for operatively connecting said oxidizer receiving means to said flow passages and each of said platelets having flow restrictors therein operatively connected to said flow passages for metering flow of propellant to each of said

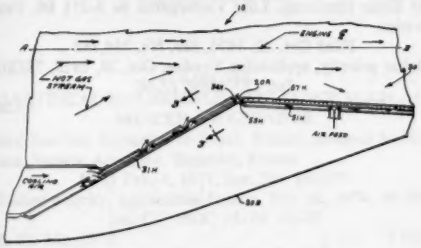
edge surface openings thereby providing homogeneous, intimately mixed propellants at all thrust levels.

4,081,137

FINNED SURFACE COOLED NOZZLE

Joel F. Sutton, Juno Isles; Allen R. Mattson, Palm Beach Gardens, and Larry E. Anders, Palm Springs, all of Fla., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jan. 5, 1977, Ser. No. 756,941
Int. Cl.[2] B64C *15/06;* B64D *33/04;* F02K *1/12, 11/02*
U.S. Cl. 239—127.3 8 Claims



1. An air-cooled, variable-throat, convergent-divergent nozzle for a turbojet engine having an inner surface and a centrally located longitudinal axis, wherein said turbojet engine is in a cool air environment and intakes cool air from said environment, and wherein said turbojet engine produces a discharge stream of hot gas within said nozzle and the stream of hot gas flows over the inner surface of the nozzle, comprising:

a. a plurality of hollow, movable convergent nozzle flaps, with each convergent flap of said plurality having an inner surface, an upstream end, a downstream end, a first side edge, and a second side edge, and with said convergent flaps disposed adjacent to each other in a second side edge-to-first side edge position, whereby an annular surface is formed;

b. a plurality of hollow, movable divergent nozzle flaps, one divergent flap for each one of the plurality of convergent flaps, with each divergent flap of said plurality having an inner surface, an upstream end, a downstream end, a first side edge, and a second side edge, and with said divergent flaps disposed adjacent to each other in a second side edge-to-first side edge position, whereby an annular surface is formed, and also with the upstream end of each divergent flap hinged to the downstream end of its respective cooperating corresponding convergent flap;

c. means for sealing and for preventing the leaking of air and hot gas between adjacent side edges of said convergent flaps, and between adjacent side edges of said divergent flaps, and also between the upstream end of each divergent flap hinged to the downstream end of its respective cooperating corresponding convergent flap, with said sealing and leaking preventing means connected to said convergent flaps and to said divergent flaps and disposed axially along said adjacent side edges of said convergent flaps and said divergent flaps;

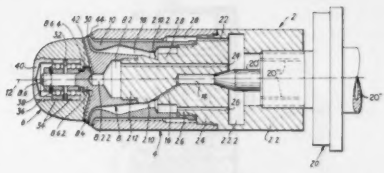
d. and, means for cooling said inner surface of said nozzle over which the stream of hot gas flows.

4,081,138

NOZZLE CONSTRUCTION

Hans Behr, Lenzhalde 82, 7000 Stuttgart, Germany

Filed Apr. 22, 1976, Ser. No. 679,229
Claims priority, application Germany, Apr. 22, 1975, 2517716
Int. Cl.[2] B05B *7/00*
U.S. Cl. 239—222.17 28 Claims



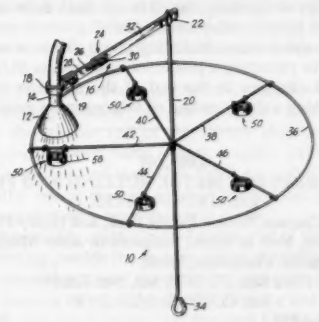
1. A nozzle arrangement which includes a nozzle holder and a nozzle cap, the improvement comprising: means for mounting the nozzle cap at a front end of the nozzle holder so as to be rotatable about a longitudinal axis, means for pneumatically rotatably driving the nozzle cap, and a stationary discharge means arranged between the front end of the nozzle holder and the rotatable nozzle cap for discharging a material from the nozzle arrangement such that the material is discharged rearwardly of the rotatable nozzle cap.

4,081,139

MULTI-CARRIER DISPENSER FIXTURE FOR SHOWER HEADS

Joseph J. Migliozzi, 71 Stanley Ave., Hastings-on-Hudson, N.Y. 10706

Filed Sep. 15, 1976, Ser. No. 723,591
Int. Cl.[2] B05B *7/24*
U.S. Cl. 239—305 7 Claims

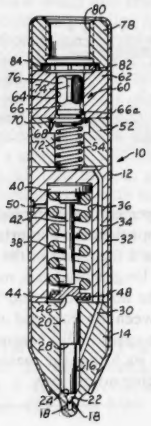


1. A multi-carrier dispenser fixture for shower heads comprising, in combination, attachment means for attaching said dispenser fixture to but externally of the shower head and the water supply pipe which feeds the same and externally of the water flow path through the shower head and water supply pipe, support means rotatably supported from said attachment means, a plurality of spaced, generally open-topped, carrier means suspended from said support means for water soluable substances, each of which may be selectively rotated into position externally of the shower head and in the path of the shower water emanating thereform to result in the selective dissolving of said substances into the shower water, said carrier means being sufficiently spaceable on said support means so that the rotation of any one of said carrier means into position in the path of the shower water will result in all other of said carrier means being positioned without the path of said shower water.

4,081,140
CAPSULE-TYPE FUEL NOZZLE

Stanley J. Kranc, Morton, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Jul. 19, 1976, Ser. No. 706,713
Int. Cl.[2] F02M *61/20*
U.S. Cl. 239—533.9 3 Claims



1. A fuel injection nozzle assembly comprising:

housing means including inlet means for receiving pressurized fuel from a fuel pump, a fuel chamber, and outlet means for communicating said fuel to the combustion chamber of an engine;

passage means for communicating fuel through said housing from said inlet means to said fuel chamber;

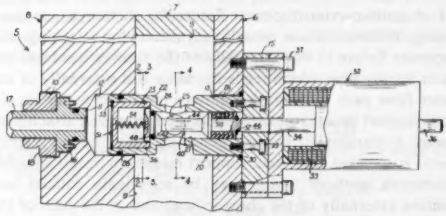
a first valve disposed in said fuel chamber at said outlet means for controlling the flow of fluid from said fuel chamber to said outlet means; and

retraction valve means including piston means at said inlet means for retracting a predetermined amount of fuel from the fuel chamber at the end of the injection cycle for establishing a sharp ending of said injection cycle.

4,081,141
SPRAY BARS FOR METAL ROLLING AND FLOW CONTROL VALVES

Richard B. Courson, Grosse Pointe Park, and Henry Piontkowski, Warren, both of Mich., assignors to Almo Manifold and Tool Company, Centerline, Mich.

Filed Sep. 27, 1976, Ser. No. 726,986
Int. Cl.[2] B05B *1/30, 1/14*
U.S. Cl. 239—551 20 Claims

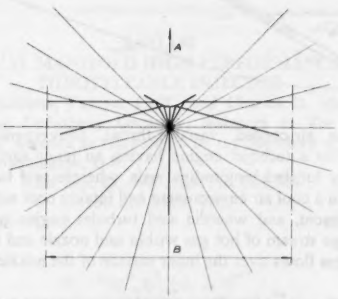


1. Improvement in a spray bar for metal rolling having a body and a plurality of spray nozzles carried thereon, a flow control valve for said spray bar for controlling the flow of liquid through said nozzles, said valve having a valve body and a valve spool reciprocable in said valve body, a liquid passage in said spray bar, said valve arranged in respect to said spray bar so that a portion thereof extends across said passage and liquid enters said valve from said passage, yieldable means operative upon said valve spool for biasing it into its closed position, said improvement comprising a moveable member for said spray bar for controlling the movement of said valve spool, means for applying a variable force on said member so that the movement of said valve spool and the flow of liquid through said valve is directly proportional to the amount of force applied to said member, said member disposed at the rear of said spray bar so that said member pushes upon said valve spool for opening said valve, and the center section of said valve body and the center section of said valve spool each being reduced in diameter in relation to the ends of said valve, and the center section of said valve body having apertures therein forming an inlet for liquid entering said valve.

4,081,142
PROTECTIVE AND LEVELLING DEVICE FOR DISTRIBUTOR MACHINES

Ernst Einar Harderup, Lilla Vastergatan 4a S-271 00, Ystad, Sweden

Filed Oct. 22, 1976, Ser. No. 734,753
Claims priority, application Sweden, Oct. 28, 1975, 7512025
Int. Cl.[2] A01C *17/00*
U.S. Cl. 239—687 1 Claim



1. In combination with a rotary spreader device for distributing a flow of granular material in a radial or tangential direction, a deflector plate disposed in the ejection plane of the flow of material and at right angles thereto producing partial interception of said flow the improvement comprising the deflector plate being in a single curvature convex configuration to provide a convex distribution impingment surface for the entire flow of material which impinges thereupon.

4,081,143
METHODS OF HANDLING WASTE

Albert O. Johnson, Livingston; William E. Holiman, and Stephen D. Buchanan, both of Houston, all of Tex., assignors to Tire-Gator, Inc., Houston, Tex.

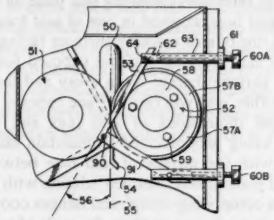
Filed Feb. 18, 1977, Ser. No. 770,002
Int. Cl.[2] B02C *4/08*
U.S. Cl. 241—29 17 Claims

1. The process of shredding materials of varying texture including combustible matter comprising the steps of

pulling said materials through a feed path by means of interengaging and rotation of a plurality of counter-rotating feed wheels mounted in spaced positions along each of a pair of parallel shafts,

shredding said materials at least in part by linearly disposed shredding members positioned between said wheels to engage the materials at an angle to the feed path through said wheels,

and selecting relative to the feed path of said materials the angle of said shredding members as a function of the



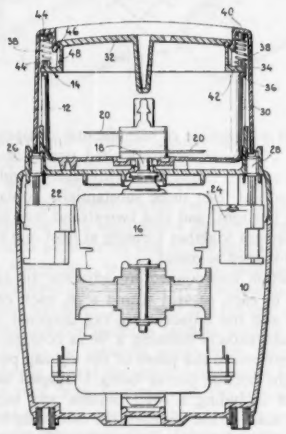
texture of particular materials passed through said feed path.

4,081,144

ELECTRICAL HOUSEHOLD APPLIANCE SUCH AS A MINCER OR GRINDER

André Bouillet, Cormelles-le-Royal, France, assignor to Moulinex, Societe Anonyme, Bagnolet, France

Filed Feb. 1, 1977, Ser. No. 764,577
Claims priority, application France, Feb. 10, 1976, 76 03565
Int. Cl.[2] B02C *18/10, 18/16*
U.S. Cl. 241—37.5 **9 Claims**



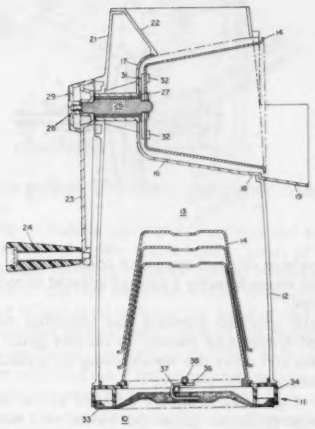
1. An electrically operated household appliance such as a grinder or mincer, comprising a casing the top of which supports a working bowl which is closed by a removable cover and in which rotate cutters driven by an electric motor which is disposed in the casing and is controlled by at least one switch having an operating key which is situated on the top part of the casing, near the said bowl, and is actuated by a skirt extending downwards from the cover, wherein the cover comprises two parts connected together telescopically, one part constituting a cap an outer edge of which is applied to the top edge of the bowl, and the other part being constituted by the skirt and being displaceable relative to the cap between a lower position, in which the skirt brings the operating key into the working position thereof, and an upper position in which the operating key is in its position of rest.

4,081,145

FOOD CUTTING MACHINE

Walter Moe, Los Angeles, Calif.; Charles Michael Diker, New York, N.Y., and Lawrence Allen Bernstein, Los Angeles, Calif., assignors to Diker-Moe Associates, Los Angeles, Calif.

Filed Apr. 18, 1977, Ser. No. 788,334
Int. Cl.[2] A47J *43/25*
U.S. Cl. 241—93 **2 Claims**



1. A hand operated food cutting machine comprising:

an upper housing defining a transverse conical flared cutting chamber having a closed smaller end, an open larger end, and a top opening;

a drive shaft transversely journaled for rotation coaxial with the cutting chamber, one end of the drive shaft extending into the smaller end of the cutting chamber and being adapted to removeably engage a rotary cutting element, the other end of the drive shaft extending outside the smaller end of the cutting chamber and being adapted to be engaged by a hand-rotatable crank;

a hand-rotatable crank coupled to the end of the drive shaft extending outside the smaller end of the cutting chamber, for imparting rotary movement to the cutting element;

a top housing on top of the upper housing and having side walls defining a hopper for directing foodstuff to the top opening of the cutting chamber;

a main housing supporting the upper housing, having a hollow interior adapted to receive for storage a stack of frustoconical rotary cutting elements, and having a bottom end adapted removably and matingly to engage a base assembly;

a base assembly adapted at its top end removeably and matingly to engage the bottom end of the main housing and having at its bottom end a flexible suction disc operable to affix the base to a work surface;

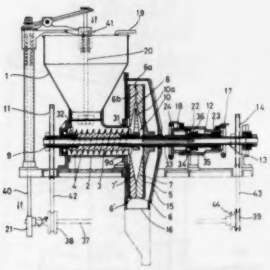
latch means associated with the base and the main housing and operable to form a substantially immovable releasable junction of the base to the main housing; and

means for simultaneously operating the suction disc to affix the base to a work surface and operating the latch means to affix the main housing to the base, said means also being effective simultaneously to release the suction from the disc and to release the main housing from the base.

4,081,146
GARBAGE DISPOSAL APPARATUS

Toshio Yagi, 5-2-15 Shinzaike Honmachi, Himeji, Japan

Filed Oct. 6, 1976, Ser. No. 730,219
Claims priority, application Japan, Apr. 20, 1976, 51-45276; Apr. 20, 1976, 51-45277
Int. Cl.² B02C 7/11
U.S. Cl. 241—152 A 10 Claims

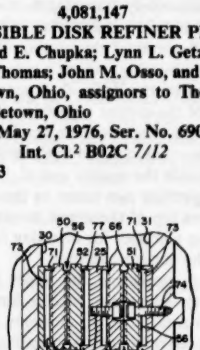


1. A garbage disposal apparatus comprising:
cylinder means forming a passage adapted to receive kitchen wastes;
a spirally grooved grinding and impelling member journalled within said passage to initially grind the kitchen wastes and move the wastes along the cylinder means to an outlet of said passage;
a pair of grinding members disposed at the outlet of said passage to further grind the wastes, said members being spring biased toward each other, one of said pair of grinding members being rotatable relative to the other;
said spirally grooved grinding member and said pair of grinding members being made of a grinding stone material;
a space defined between said pair of grinding members; and
a movable impelling means located within said space and moving said wastes centrifugally from said space.

4,081,147
REVERSIBLE DISK REFINER PLATES

Peter Seifert; David E. Chupka; Lynn L. Getz; Derald R. Hatton; R. Marvin Thomas; John M. Osso, and Herbert A. Rogl, all of Middletown, Ohio, assignors to The Black Clawson Company, Middletown, Ohio

Filed May 27, 1976, Ser. No. 690,548
Int. Cl.² B02C 7/12
U.S. Cl. 241—261.3 2 Claims

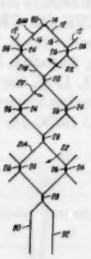


1. A reversible refiner plate assembly for a disk-type refiner which includes a stator and a rotor having opposing faces, comprising,
(a) an annular refiner plate having a working surface on each side thereof composed of alternating bars and grooves,
(b) said refiner plate having locating grooves on the sides thereof,
(c) means on one of said opposing faces of said stator and rotor defining a seat for said refiner plate and including lugs projecting axially from said seat in position to be received in said locating grooves,
(d) means for releasably clamping said plate on said seat with each of said lugs received in one of said locating grooves and with one of said working surfaces facing said seat and the other said working surfaces exposed for use, or with one said surface thereof worn away and facing said seat and the other said working surface exposed for use,
(e) the axial dimensions of said lugs and said locating grooves being proportioned to maintain said bars out of contact with the surface of said face between said lugs with said plate in said clamped relation with said seat, and
(f) said lugs comprising cylindrical flanges cooperating with said locating grooves to close the ends of said grooves in said one working surface facing said seat to prevent bypass flow of stock between said one working face and said seat.

4,081,148
PLANT SUPPORT

George W. Murphy, 2328 Ashwood La., Norman, Okla. 73069

Filed Aug. 13, 1975, Ser. No. 604,355
Int. Cl.² B21F 27/02
U.S. Cl. 245—5 3 Claims



1. A woven wire article of manufacture comprising:
a plurality of releasably interlocked wire strand elements each having two strand legs, with each of said strand legs formed into at least three substantially coplanar zig-zag diagonal portions, and said two-strand legs of each wire strand element together forming at least one substantially diamond-shaped segment;
a bight portion interconnecting adjacent zig-zag diagonal portions in each of said strand legs, each of said bight portions and the adjacent zig-zag diagonal portions together substantially forming a W in configuration when viewed normal to the plane of the zig-zag portions, with each bight portion per se being U-shaped in configuration, and including a web portion and bight legs on opposite sides of the web portion extending to the immediately adjacent zig-zag diagonal portions, each of said wire strand elements having its strand legs interconnected at at least two opposite corners of each of said diamond-shaped segments; and
each pair of interlocked wire strand elements having a pair of said first bight portions of the respective wire strand elements in the pair of interlocked wire strand elements interconnected at a third corner of each of said diamond-shaped segments by releasable, mutual frictional engagement of said first interconnected bight portions with each other, the legs of one of said first interconnected bight portions crossed over the legs of the other of said first interconnected bight portions and the web portions of each of said first interconnected bight portions being twisted through an angle of more than 180° from the plane of the zig-zag diagonal portions adjacent the respective first bight portions in which the respective web portion is

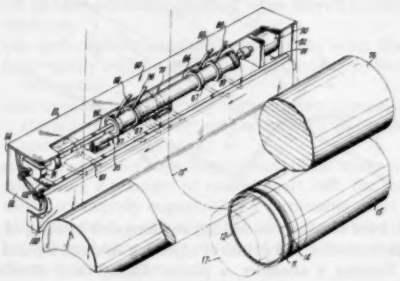
located to form a partially closed hook with its respective adjacent bight legs, and the web portions of said first interconnected bight portions extending substantially parallel to each other, said first interconnected bight portions being physically interlocked in an interference fit to prevent their separation from each other except by forcing said web portions of the first bight portions to yield in a direction opposite the direction in which the respective web portions have been twisted through said angle and to most past each other as said separation is effected.

4,081,149

MECHANISM FOR FORMING TRANSFER TAILS ON WOUND YARN PACKAGES

Harry Benjamin Miller, Charlotte, N.C., assignor to Industrie-Werke Karlsruhe Augsburg Aktiengesellschaft, Germany

Filed May 28, 1976, Ser. No. 690,967
Int. Cl.[2] B65H *63/00, 54/02*
U.S. Cl. 242—18 PW **16 Claims**



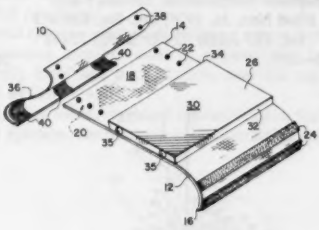
1. Mechanism for forming transfer tails on yarn packages wound on package supports, such as a bobbin or tube, mounted on a yarn winder having a traverse guide for cross-winding yarn, strung in the winder, on the package supports, while the latter are rotated at a high speed by the winder, with yarn catching means adjacent an end of the package supports: said mechanism comprising, in combination, yarn engaging means adjacent a traverse guide selectively operable to have engaged therein a yarn, strung in the winder and fed into yarn receiving means of the winder under a tension tending to move the strung yarn into the traverse guide; yarn restraining means movable relative to said engaging means into a first position to restrain the yarn from entering into the traverse guide, and into a second position releasing the yarn to enter the traverse guide; and yarn movement control means, including said movable restraining means, cooperable with said engaging means to effect movement of the yarn, engaged in said engaging means, into alignment with the yarn catching means on a package support for winding of at least one turn of yarn on such package support at the catching means thereon, and then to effect movement of the yarn, while engaged in said engaging means, along such package support to wrap several turns of the yarn directly onto the package support to form a transfer tail extending along a selected length of the package support axially inwardly of the catching means thereof; said movement control means, following formation of the transfer tail, effecting disengagement of the yarn from said engaging means, and release of the yarn from said restraining means, by movement of said restraining means to its second position, to enter the traverse guide for formation of a yarn package on the yarn package support.

4,081,150

MULTI-PURPOSE THERAPEUTIC PAD

Gordon Tyson, 256 Betty Ann Dr., Willowdale, Ontario, Canada

Filed Jan. 5, 1977, Ser. No. 756,820
Int. Cl.[2] A61F *7/00*
U.S. Cl. 128—402 **4 Claims**



1. A multi-purpose therapeutic pad device comprising in combination:

a first strip of flexible material having first and second opposed faces and a pair of free ends, a series of longitudinally spaced fastening elements carried by said strip adjacent one of said free ends, and Velcro fastening means on one face of said strip adjacent the other of said free ends;

a pouch member integral with said strip and projecting from one of said faces intermediate said free ends, said pouch member including inner and outer walls and the said inner wall being common to said strip and pouch member; and

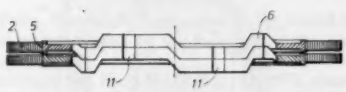
a second strip of elastic material having a series of longitudinally spaced fastening elements adjacent one free end thereof cooperable with selected fastening elements on said first strip for releasably connecting said one free end of said first and second strips, Velcro fastening means being provided on said second strip adjacent the other free end thereof cooperable with the Velcro fastening means on said first strip for releasably connecting said other free ends of said first and second strips.

4,081,151

STACKABLE WINDING CORES FOR MAGNETIC TAPES

Günter Ender, Munich; Helmut Schultz Gauting; Hartmut Thiele, Munich; Leo Gruber, Pentenried; Heinrich Kober, Hohenschaeftlarn; Werner Böttcher, Munich, and Tibor Macheiner, Oberschleissheim, all of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Germany

Filed Oct. 8, 1975, Ser. No. 620,645
Claims priority, application Germany, Oct. 14, 1974, 2448853
Int. Cl.[2] B65H *75/18*
U.S. Cl. 242—68.5 **7 Claims**



1. A stackable winding core for a magnetic tape, the core having an annular body defining an axial, cylindrical bore and a peripheral winding surface situated centrally with respect to the medial plane of the core, the annular body having horizontal surfaces between the cylindrical bore and the winding surface, the annular body being provided with deformations which project from a medial plane of the core alternately upwardly and downwardly by about the width of the annular body and protrude beyond the horizontal surface of the annular body by about half the width of the annular body and the deformations on both sides of the winding core being interlockable with each other when the cores are stacked so that the

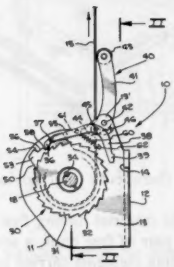
peripheral winding surfaces of adjacent cores are situated closely adjacent one another.

4,081,152

DUAL TENSION RETRACTOR

Cyril Henderson, Woodland Hills, Calif., assignor to American Safety Equipment Corporation, Encino, Calif.

Filed Nov. 26, 1975, Ser. No. 635,413
Int. Cl.² A62B *35/00*; B65H *75/48*
U.S. Cl. 242—107 **16 Claims**



1. Tension relieving means for safety belt retractors having a safety belt storage means, a safety belt connected thereto and biasing means for normally biasing such belt storage means toward a belt retracted condition producing a first tension in said safety belt when it is protracted to a position of use said tension relieving means comprising:

means for restricting retractive bias of said biasing means to provide a second tension on said belt of a lower value than that of said first tension due to said biasing means; and

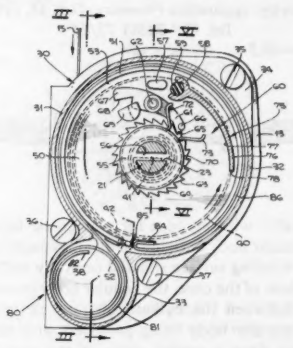
means for automatically operating said restricting means to a restricting condition only upon a slight retraction of the safety belt following a protraction thereof to any position of use.

4,081,153

SAFETY BELT TENSIONING AND REWINDING RETRACTOR

Akira Tanaka, Northridge, and Charles Ulrich, Montecito, both of Calif., assignors to American Safety Equipment Corporation, Encino, Calif.

Filed Dec. 17, 1976, Ser. No. 751,753
Int. Cl.² A62B *35/00*; B65H *75/48*
U.S. Cl. 242—107 **19 Claims**



1. A safety belt tensioning and rewinding retractor having a safety belt storage reel rotatably mounted to a retractor frame and lockable against belt unwinding by emergency locking means, said retractor comprising:

a member rotatably mounted to said frame and means for limiting rotation of said member in a first rotative direction;

first spring means connected between said member and reel for biasing said member toward said limiting means and said reel in an opposite, belt rewinding direction;

means for releasably connecting said member to said reel to block the bias of said first spring means when said belt is placed in a position of use; and

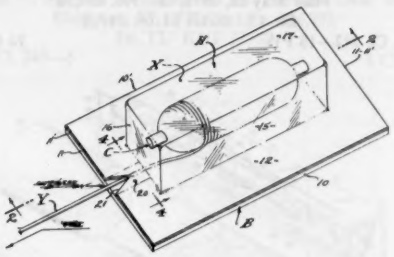
second spring means for biasing said member in a belt rewind direction whereby said reel, when connected to said member by said connecting means, is biased in a rewind direction by said second spring means.

4,081,154

YARN DISPENSER

Anthony W. Miszkwitz, Jr., 21745 Hwy. 18, Apple Valley, Calif. 92307

Filed Apr. 21, 1976, Ser. No. 678,681
Int. Cl.² B65H *49/00*
U.S. Cl. 242—129.8 **7 Claims**



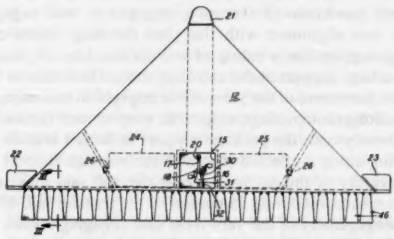
1. A yarn dispenser including, an elongated housing of uniform cross section comprised of adjoining side and top and end walls forming a chamber, a planar display card closure in cooperation with said housing and comprising the bottom of said chamber, a bobbin carrier spirally wound with the yarn to be dispensed and disposed lengthwise of the chamber within the housing and free of the end walls and with the yarn free to turn within the side and top walls and closure bottom, and a passage area at one side of the housing frictionally engaging the yarn as it extends tangentially from the bobbin carrier to be withdrawn.

4,081,155

MAN-POWERED FLYING MACHINE

Shang-Ming Kuan, 17 G. Everwell Garden, Sheung Sheng St., Tin Kong Rd., Kowloon, Hong Kong

Filed Dec. 27, 1976, Ser. No. 754,744
Int. Cl.² B64C *33/02*
U.S. Cl. 244—72 **5 Claims**



1. A flying machine having a frame, a wing affixed to said frame and sufficient to support said machine and an operator in

forward flight at a flight speed, control means for guiding said machine in flight, ground support means for supporting said machine upon a ground surface, and propulsion means, said propulsion means comprising:

a plurality of stiff, flat fans oscillatably mounted upon said frame on an axis of oscillation transverse to the forward flight direction; and

means for oscillating said fans in up and down arcuate strokes, said means comprising,

a rotatable crank shaft extending parallel to said axis,

a plurality of flap boards affixed to said crank shaft for rotation therewith, each of said flap boards extending radially of said crank shaft and engaging a corresponding one of said fans to oscillate said fan from one end of its said up and down arcuate stroke to an opposite end; and

an elastic band extending from each of said fans to a fixed point of said frame and said bands urging said fans to said one end of their arcuate strokes,

whereby ambient air about said machine is directed rearwardly of said machine by movement of said fans with sufficient force to propel said machine forwardly in reaction thereto at said flight speed.

5. A man-powered airplane vehicle comprising:

a triangularly shaped main wing comprising an airfoil having lift surfaces providing lift force when moved in a forward direction,

one apex of the triangularly shaped wing being disposed forwardly and the other two disposed at opposite side extremities,

selectively movable control surface means comprising an elevator tab at the front apex and aileron tabs at the side apices of the main wing,

oscillating means for imparting forward thrust to the vehicle comprising a plurality of spaced apart stiff, flat fan elements operatively engageably by a rotatable crank shaft and disposed in a row along the rear edge of the triangularly shaped wing and constructed for moving in up and down arcuate strokes, and

a bicycle pedal and crank assembly foot operated by the operator to rotatably drive the crank shaft and oscillate the fan elements,

whereby the vehicle can take-off unassisted and fly above the ground under the power and control of a single human operator.

4,081,156

PROTECTION DEVICE FOR ARMS OF EJECTION SEAT OCCUPANT

Willie Åke Ideskär, Linkoping, Sweden, assignor to Saab-Scania Aktiebolag, Linkoping, Sweden

Filed Jan. 25, 1977, Ser. No. 762,240

Claims priority, application Sweden, Jan. 28, 1976, 7600854

Int. Cl.[2] B64D *25/04, 25/10*

U.S. Cl. 244—122 AG **11 Claims**

1. In an ejection seat having a substantially horizontal seat portion and a back portion projecting upwardly from the seat portion at the rear thereof, said seat being arranged to be ejected substantially vertically out of an aircraft in which the seat is normally carried and in which there is structure that is spaced laterally to opposite sides of said seat and back portions, restraining means for protecting the arms of an occupant of the seat during ejection thereof, said restraining means comprising:

A. a pair of net-like restraining members, one at each side of the ejection seat, each of said restraining members being substantially triangular so as to have first, second and third corner portions,

(1) the first corner portion of each restraining member being secured to its adjacent side of the back portion, near the top thereof, and

(2) each restraining member, when extended, being of such size that

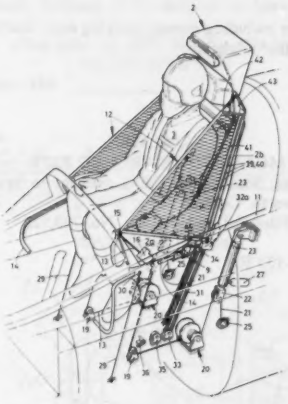
(a) the second corner portion thereof can be located near the front of the seat portion at its adjacent side thereof, and

(b) the third corner portion thereof can be located near the junction of the seat and back portions, at its adjacent side thereof;

B. readily releasable confining means for each restraining member normally maintaining the restraining member in a furled condition;

C. means so supporting said confining means that each furled restraining member extends substantially laterally outwardly from said back portion, near the top thereof, to said structure; and

D. actuating means rendered operative upon the initiation of seat ejection, for drawing each restraining member away



from its said confining means and unfurling the restraining member with a motion that has forward, downward and laterally inward components, said actuating means comprising for each restraining member

(1) guide means fixed to the side of said seat portion near the front thereof,

(2) a first elongated tension element having a connection with said second corner portion of the restraining member and which extends through said guide means, and

(3) a second elongated tension element having a connection with said third corner portion of the restraining member and which is constrained to lengthwise motion substantially downwardly relative to the seat and alongside the back portion.

4,081,157

AIRCRAFT CONVEYOR LOAD REDISTRIBUTION SYSTEM

Gene A. Petry, Conover, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Continuation of Ser. No. 679,410, Apr. 22, 1976, abandoned.

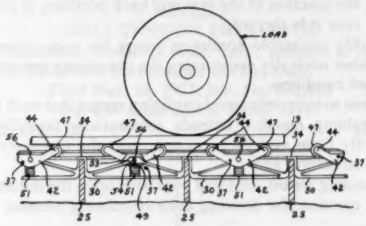
This application Apr. 11, 1977, Ser. No. 786,691

Int. Cl.[2] B64C *1/22*

U.S. Cl. 244—137 R **2 Claims**

1. In a cargo aircraft having a plurality of bulkheads supporting the cargo floor of the aircraft; conveyor apparatus within said aircraft for loading and unloading nonuniformly loaded palletized loads on said aircraft; said conveyor apparatus having a plurality of rollers; apparatus for redistributing the nonuniform palletized loads on said conveyor apparatus and said bulkheads comprising: a plurality of conveyor support frames supported on said bulkheads; a plurality of roller support frames pivotably supported on said conveyor support frames; said roller support frames being supported on said conveyor support frames approximately midway between pairs of bulkheads; means connected between the conveyor support frames

and the roller support frames for transferring excessive loads on certain of said rollers to adjacent rollers; said conveyor



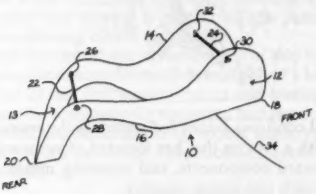
support frames including means, hooking over said bulkheads, for engaging the bulkheads.

4,081,158

MONOCOQUE ARCHED KITE

Peter J. Pearce, Studio City, Calif., assignor to Synestructics, Inc., Chatsworth, Calif.

Filed Jul. 8, 1976, Ser. No. 703,522
Int. Cl.[2] B64C *31/06*
U.S. Cl. 244—153 R **13 Claims**



1. A kite comprising a unitary sheet of a relatively stiff flexible material arched about a longitudinal axis and having a forward aerodynamic surface, an aft aerodynamic surface and an aperture through said sheet longitudinally intermediate said forward aerodynamic surface and said aft aerodynamic surface, a forward tension member and an aft tension member of substantially equal length, each said tension member connected between corresponding opposing points proximate the sides of the kite, wherein the separation measured along the arched surface of the kite between the connected opposing points of said forward tension member is greater than the separation measured along the arched surface of the kite between the connected opposing points of said aft tension member, holding the surface of the kite in a shape approximating that of a portion of the surface of a cone having a longitudinally-directed axis.

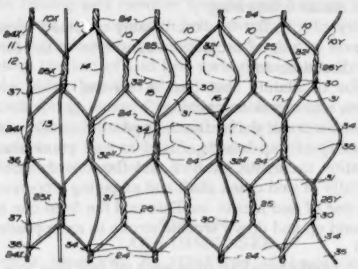
4,081,159

CONCRETE REINFORCEMENT

Ernest Baldwin, Sheffield, England, assignor to Tinsley Wire Industries Limited, Sheffield, England

Filed Jul. 23, 1976, Ser. No. 707,950
Claims priority, application United Kingdom, Jul. 24, 1975, 30951/75
Int. Cl.[2] B21F *27/20*
U.S. Cl. 245—2 **15 Claims**

1. Reinforcement for concrete for covering pipes comprising wire netting with a straight selvedge wire along only one edge of the netting and with line wires extending through at least some twists of the netting, at least some of the line wires including the line wire remote from the selvedge wire being



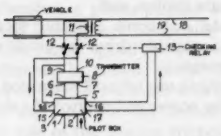
crimped in at least some of the meshes of the netting across which they extend.

4,081,160

FAIL-SAFE CAB SIGNAL PROCESS FOR TRANSMITTING INFORMATION BY HIGH-VOLTAGE PULSED TRACK CIRCUITS, AND APPARATUS FOR CARRYING THE PROCESS INTO EFFECT

Robert C. Devy, Le Blanc Mesnil, and Jean P. Salmon, Sevran, both of France, assignors to Jeumont-Schneider, Puteaux, France

Filed Sep. 28, 1976, Ser. No. 727,430
Claims priority, application France, Oct. 1, 1975, 75 30006
Int. Cl.[2] B61L *3/24*
U.S. Cl. 246—63 C **25 Claims**



1. A method for communicating information comprising a plurality of data items to a rail vehicle by transmission of pulses at predetermined repetition rates along railway tracks comprising the steps of:

a) encoding each of said data items as pulses occurring at a selected repetition rate;
b) transmitting said pulses at said selected repetition rate along said tracks;
c) receiving said pulses;
d) removing interference signals from said pulses, said interference signals attributable to a number of causes, which include:
i) unbalanced traction return currents, and/or
ii) transmission interferences;
e) regenerating said received pulses;
f) determining the repetition rate of said received pulses;
g) decoding information from said determined repetition rate, and
h) indicating the decoded information in said rail vehicle.

14. An apparatus for communicating information comprising plural items of data between a first station and a rail vehicle by transmission of pulses at predetermined repetition rates along railway tracks comprising:

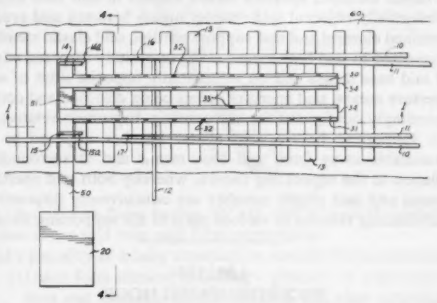
a. a transmitting station for generating information pulses for transmission, comprising:
   1. control means receiving a particular data item as an input for selecting a repetition rate to represent said particular data item for transmission, and
   2. generating means connected to said control means for generating said information pulses;
b. railway tracks for transmitting said generated information pulses thereon;
c. coupling means for coupling said information pulses to said tracks;
d. a receiving station receiving said information pulses from said tracks, comprising:
   1. sensing means for sensing said information pulses from said tracks,
   2. means for removing interference signals received along with said information pulses from said tracks, said interference signals attributable to a number of causes which include:
      i. unbalanced traction return currents, and/or
      ii. transmission interferences
   3. means connected to said removing means for determining a repetition rate of said received pulses,
   4. means for decoding information from said determined repetition rate thereby to determine the particular data item transmitted, and
   5. means for indicating said particular data item.

4,081,161

HEATER SYSTEM FOR RAILROAD SWITCH

Neil Upright, 11825C - 145 St., Edmonton, Alberta, Canada

Continuation of Ser. No. 508,347, Sep. 23, 1974, abandoned. This application Dec. 3, 1976, Ser. No. 747,339
Int. Cl.[2] E01B 7/24
U.S. Cl. 246—428 **9 Claims**



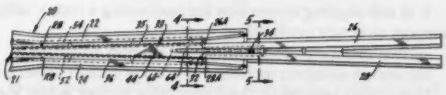
1. A heater system for a railroad switch having a pair of fixed outer rails and a pair of inner movable rails therebetween mounted on an arrangement of ties on a switch grade, each of said movable rails having a switch point, said heater system comprising:
means adjacent the switch for supplying forced hot air;
a cross duct extending from the hot air means beneath the adjacent outer and inner rails;
longitudinally extending distribution ducts mounted on the ties between and adjacent the movable rails;
means connecting said distribution ducts to said cross duct for the supply of said hot air thereto;
each of said distribution ducts having a plurality of openings provided in both of its sides and spaced along and throughout the longitudinal extent thereof for dispensing hot air transversely outwardly toward the rails and the end portions of the ties as well as directly transversely inwardly toward and across the central portion of the switch grade between the rails;
said entire system, except for said hot air supply means and said cross duct, being disposed entirely and solely between and interiorly of said outer rails, and wherein the spaces defined between adjacent ties within the vicinity of said movable and fixed rails are longitudinally unobstructed so as to permit said outwardly transversely dispensed hot air to flow freely through said spaces beyond said end portions of said ties; and
said hot air supply means being selected so as to provide a sufficient volume of hot air at a sufficient velocity at the duct openings so as to melt the snow and ice on the switch grade and to forcefully clear the produced water outwardly beyond said outer rails and from the grade across the entire length of the ties.

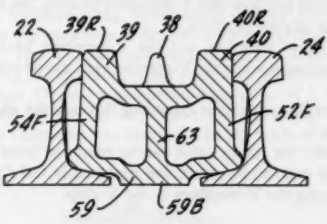
4,081,162

RAILROAD FROGS

Earl E. Frank, Tallman, N.Y., assignor to Abex Corporation, New York, N.Y.

Filed Mar. 21, 1977, Ser. No. 779,620
Int. Cl.[2] E01B 7/10
U.S. Cl. 246—458 **2 Claims**





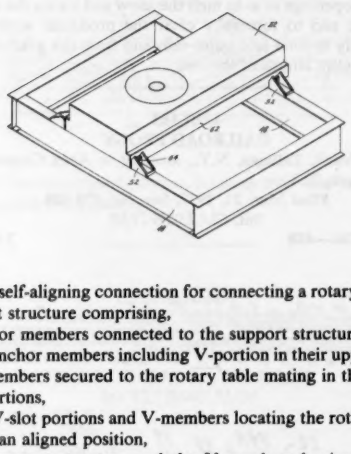
1. In a railbound railroad frog casting bounded on opposite sides by separate wing rails, a one-piece frog casting comprising: frog point, said frog point terminating at a rear end in a heel and heel extension and at the opposite end in an actual point of frog, a pair of wings each spaced laterally from a respective side of the frog point to afford flangeways therewith and defining a frog throat forward of said actual point of frog, said wings having respective wheel tread running surfaces adjacent the throat, said frog point having a horizontal top wall presenting a substantially flat wheel tread running surface of triangular form in plan view which is widest at the heel and narrows toward the actual point of frog, said running surface being bounded at the opposite sides by respective gage lines extending immediately downwardly therefrom with laterally spaced side walls substantially centered on and located directly beneath the respective gage lines in supporting relation thereto, said side walls also extending toward the frog throat and supporting the wing running surfaces, a horizontal bottom wall joining the lower extremities of the two side walls from the heel end forwardly toward the actual point of frog, a vertical center rib located between the two side walls and joining the top wall and the bottom wall beneath the running surface at the heel end of the frog point and extending forwardly thereof, a top web joining the wings forwardly of the actual point of frog, said bottom wall being extended forwardly and joined to the forward extensions of the side walls, a vertical center rib joining said web and the forward extension of said bottom wall; said wing rails being positioned outwardly of the wings of the casting in abutting relation thereto, and in which the bottom wall has lateral extremities reposing on the flanges of the wing rails so that wheel loading on the frog is borne at least in part by the wing rails.

4,081,163

BLOW OUT PREVENTER HANDLING SYSTEM

David C. Guinn; Archie K. Haggard, and John P. Thomas, all of P.O. Box 1126, Houston, Tex. 77001

Filed Oct. 4, 1976, Ser. No. 729,494
Int. Cl.[2] H02B 5/00; F04B 35/04
U.S. Cl. 248—2 3 Claims



1. A self-aligning connection for connecting a rotary table to support structure comprising,

anchor members connected to the support structure,

the anchor members including V-portion in their upper ends,

V-members secured to the rotary table mating in the V-slot portions,

the V-slot portions and V-members locating the rotary table in an aligned position,

the support structure and the V-members having aligned receptacles when the V-members are mated in the V-slots, and

removable projections extending through the aligned openings,

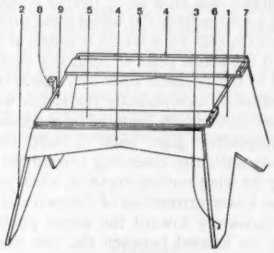
whereby the rotary table can be removed from the rotary table support structure and replaced in self-alignment by placing the V-members in the V-slots.

4,081,164

FRAMEWORK ASSEMBLY FOR FURNITURE

Jacques Pierre Georges Laine, 29, avenue du Gl De Gaulle, 77 Montereau, France

Filed Jun. 1, 1973, Ser. No. 366,124
Claims priority, application France, Jun. 8, 1972, 7220711
Int. Cl.[2] A47B 13/00
U.S. Cl. 248—188.3 5 Claims



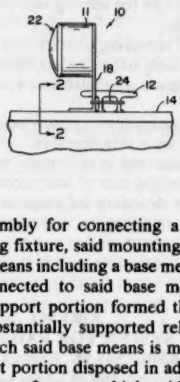
1. An assembly for supporting a member to form a furniture piece, said assembly comprising a frame, two spaced leg units connected to the respective ends of said frame to form a sub-assembly, said frame being capable of elastic deformation under the weight of said member to permit relative movement between said leg units to accommodate irregularities in the floor on which the sub-assembly is mounted, means for securing said member to one end of said sub-assembly, and a bracket pivotally mounted to the other end of said sub-assembly for supporting said member relative to said frame in a plurality of angular positions to accommodate said relative movement.

4,081,165

MOUNTING ASSEMBLY

Gene Fentress, 1825 Oak Park Dr., North, Clearwater, Fla. 33516

Continuation of Ser. No. 541,726, Jan. 17, 1975, abandoned. This application Dec. 27, 1976, Ser. No. 754,799
Int. Cl.[2] A47B 96/06
U.S. Cl. 248—205 R 4 Claims



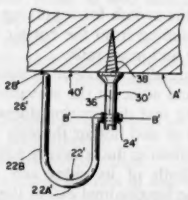
1. A mounting assembly for connecting a predetermined element on a supporting fixture, said mounting assembly comprising: a first fixture means including a base means, said predetermined element connected to said base means; said base means comprising a support portion formed thereon and disposed in engaging, substantially supported relation to a supporting surface on which said base means is mounted, at least one side of said support portion disposed in adjacent relationship to the supporting surface on which said base means is mounted; said mounting assembly further comprising retainer means comprising an elastic, elongated member mounted on said base means between said support portion and said predetermined element; aperture means formed in said base means substantially adjacent said retainer means between said predetermined element and said support portion, said elastic member connected to said base means along oppositely disposed edges of said base means and on substantially opposite sides of said aperture means, said aperture means being disposed and correspondingly configured for surrounding disposition relative to the supporting fixture, said elastic member disposed to be extendable away from said base means and in surrounding relation to the supporting fixture, whereby both said aperture means and said elastic member are concurrently disposed in surrounding relation to various parts of the supporting fixture.

4,081,166

SECURING SWING HOOK

Strohm Eamil Lippert, P.O. Box 305, Big Bear City, Calif. 92314

Filed Jul. 6, 1976, Ser. No. 702,602
Int. Cl.[2] F16B 45/00
U.S. Cl. 248—306 3 Claims



1. A securing hook for releasably supporting an article, comprising, in combination, hook means, mounting means for mounting said hook means on a supporting surface, and a generally horizontally extending member, said hook means comprising a generally U-shaped intermediate portion having

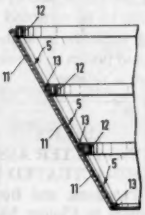
first and second leg portions connected by a curved bight portion, a first end portion connected to said first leg portion and adapted for rotatable mounting on said mounting means such that said hook means has a generally horizontal axis of rotation lying in a plane defined by said first and second leg portions and rotation of said hook means causes displacement of said U-shaped intermediate portion away from a first stable rest position wherein said U-shaped portion is substantially vertically oriented with the curved portion thereof in a lowermost position, and a second elongated end portion forming an extension of said second leg portion of said U-shaped portion and so constructed that when said hook means is in said rest position, the tip of said second end portion is disposed in proximity to said horizontally extending member so as to prevent accidental removal of an article when said hook means is in said rest position, and to allow removal of an article when said hook means is rotated to a second release position wherein the tip of said second end portion is remote from said horizontally extending member.

4,081,167

VERTICALLY FLARING CONCRETE FORM

Otto Heinzle, Sonderberg 19, Gotzis (Vorarlberg), Austria

Filed Oct. 12, 1976, Ser. No. 731,454
Claims priority, application Austria, Oct. 14, 1975, 7843/75
Int. Cl.[2] B28B *7/28*
U.S. Cl. 249—10 **8 Claims**



1. A concrete form having an axis and a conical, convex surface about said axis, said form comprising:

(a) a plurality of axially consecutive, annular form elements,

(1) each form element including a plurality of plate members and fastening means fastening said plate members to each other in a closed loop in circumferentially juxtaposed relationship,

(2) each plate member having an outer face constituting a portion of said surface, an inner face parallel to said outer face and obliquely inclined relative to said axis, and first and second, axially spaced, circumferentially elongated edge portions of different length connecting said faces; and

(b) first and second coupling members fixedly secured to the inner face of each plate member and projecting from the associated inner face in a radially inward direction axially adjacent said first and second edge portions respectively,

(1) said first coupling member projecting axially beyond the adjacent first edge portion,

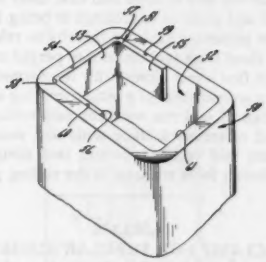
(2) each coupling member having a face cylindrically arcuate about and parallel to said axis of said conical form and conformingly engaging a corresponding face of a coupling member on a plate member of an axially consecutive form element in radially abutting engagement, thereby coupling two form elements to each other.

4,081,168

HOT TOP LINING SLABS AND SLEEVES

Robert Edwin Atterbury, Birmingham, England, assignor to Foseco Trading, A.G.

Division of Ser. No. 505,388, Sep. 12, 1974, Pat. No. 3,958,988, which is a continuation-in-part of Ser. No. 24,021, Mar. 30, 1970, abandoned, and a continuation-in-part of Ser. No. 134,023, Apr. 14, 1971, abandoned. This application Mar. 10, 1976, Ser. No. 665,682
Int. Cl.[2] B22D *7/10*
U.S. Cl. 249—106 **8 Claims**



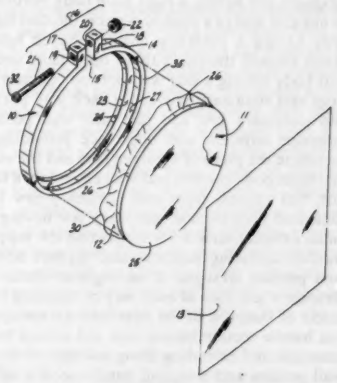
1. In an ingot mould head having a cavity the walls of which are lined with a hot top slab or sleeve, the improvement wherein the hot top slab or sleeve comprises a refractory, deformable, self-supporting, substantially uniform fibrous mat having in its dry condition a flexibility such that the mat deforms by 0.7 cm. without total fracture under a load not exceeding 20 Kg., a restitution of not more than 30%, a droop of not more than 17 cm., a compressibility value of 0.1 to 0.6 Kg./cm^2, and an extensibility value not exceeding 50 Kg. permanently deformed into contact with the walls of the cavity.

4,081,169

DOUGH FRAME

Ida N. Lauter, Rte. 7, Box 329, Poplar Bluff, Mo. 63901

Filed Jul. 2, 1976, Ser. No. 701,989
Int. Cl.[2] B29C *1/00*; A21C *11/00*
U.S. Cl. 249—115 **2 Claims**



1. A dough frame in which dough, such as pie dough or the like, may be readily rolled to a predetermined uniform thickness and size, removed from the dough frame, and placed in a pie pan, said dough frame comprising an outer annular rim and a disc-like plate removably fitted within said rim, said rim having a shoulder on its inner face for engagement with the bottom face of said plate and an upper portion of said rim extending above the upper face of said plate when the latter is

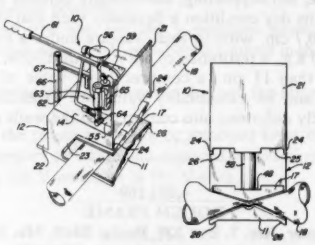
supported on said shoulder thereby to define a mold cavity in which said dough is to be formed, the upper edge of said rim constituting a reference surface over which a rolling pin or the like may be operated to form the dough to the shape of said cavity, a first sheet of non sticky plastic film or the like overlying the upper face of said plate and extending to be interposed between the outer circumferential face of said plate and the inner circumferential face of said rim, said upper portion of said rim extending above said film to be engaged by the dough being molded, said rim having means for adjustably tightening said rim on said plate and on said first sheet interposed therebetween thereby to securely clamp said plate and said first sheet relative to said rim and to hold said first sheet in place on the upper face of said plate as said dough is being formed in said cavity and for loosening said rim thereby to release said plate and said first sheet from said rim and to permit removal of said plate and said first sheet along with the formed dough from said rim, and a second sheet of plastic overlying said cavity and said upper edge of said rim whereby said rolling pin may be rolled on said reference surface with said second sheet disposed between said rolling pin and said dough thereby to prevent the dough from sticking to the rolling pin.

4,081,170

CLAMP FOR TUBULAR BODIES

Desmond T. Doss, Jr., P.O. Box 36, Englewood, Colo. 80110

Filed Apr. 12, 1976, Ser. No. 676,245
Int. Cl.[2] F16K *7/07*
U.S. Cl. 251—5 **21 Claims**



1. A portable hydraulic clamp for regulating and for closing off flow through a fire hose and the like comprising:

a stationary jaw having a rigid main body portion formed as an integral wall of a rigid one-piece, die-cast metal support body having a generally channel-shaped hose-receiving cavity formed therein with an open face, said rigid support body having a side wall portion opposite and spaced from said stationary jaw and a back wall portion joining said stationary jaw and said side wall portion, a wall extension adjacent said open face providing a support surface in the plane of the open face and the extremities of said main body portion and wall extension, a flange extension that extends from said stationary jaw beyond said back wall portion, said stationary jaw having foot means on an external surface for supporting the support body in another operating position, said support body having a web portion arranged at an angle of about 60° to said stationary jaw face at each end of the cavity to limit the extent of insertion of the hose into the cavity;

a first handle section having one end affixed to said flange extension and extending along and spaced from said back wall portion and a second handle section affixed at one end to said first handle section and extending along and spaced from said side wall portion and affixed to said side wall portion, said first handle section being hollow and arranged to telescopically receive a removable actuating handle;

a movable jaw having a rigid main body portion disposed in said cavity opposite said stationary jaw movable toward and away from said stationary jaw between extended and retracted positions, each of the main body portions of said stationary and movable jaws having a pair of angularly disposed jaw faces that converge toward a central apex at an angle of about 20°, the main body portion of said movable jaw having a first clamping edge at said central apex for applying pressure in a direction transverse to one side of said hose, the jaw faces of said movable jaw having an inner liner of resilient material and an outer liner of a friction material, the main body portion of said stationary jaw having an arcuate recess at said center apex to receive said first clamping edge and provide a pair of clamping edges offset to each side of said first clamping edge along said hose for applying pressure in a direction opposite from said one side of said hose to clamp the hose between said jaws into an angle and prevent relative movement between said hose and said jaws, said jaw faces and the recess of said stationary jaw having an inner liner of resilient material and an outer layer of a friction material; and

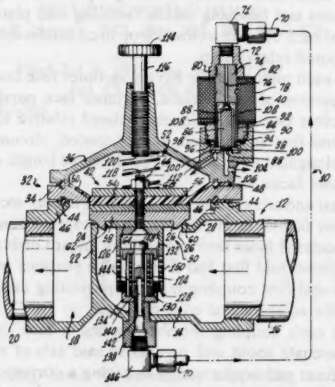
a hydraulic drive system for gradually moving said movable jaw to the extended position, said drive system including a hydraulic cylinder on said side wall portion having a piston movable in said cylinder in response to hydraulic pressure applied to said cylinder, said piston extending through an aperture in said side wall portion and having said movable jaw affixed to the free end thereof, a pump on said side wall portion having a handle socket that is actuated by the movement of said removable actuating handle, a reservoir body forming an integral part of said support body containing a fluid that is pumped by said pump into said cylinder to move said movable jaw to the extended position, a regulator valve coupled to an outlet of the pump and an inlet of the cylinder to return fluid to the reservoir body once a predetermined maximum pressure is reached in said cylinder, and a petcock valve coupled for returning fluid from said cylinder to said reservoir to enable the piston to be returned to the retracted position and a spring member in said cylinder arranged to gradually return said piston to the retracted position when said petcock valve is released.

4,081,171

SELF-CLEANING FILTER ASSEMBLY FOR SOLENOID-ACTUATED VALVES

Norman D. Morgan, Pasadena, and Bodo Pilz, Temple City, both of Calif., assignors to Clemar Manufacturing Corporation, Azusa, Calif.

Filed Jun. 7, 1976, Ser. No. 693,514
Int. Cl. F16k *31/02*
U.S. Cl. 251—30 **11 Claims**



1. In a solenoid-actuated valve of the type including an inlet chamber and an outlet chamber, a diaphragm operated by fluid pressure for opening and closing a valve between the inlet and

outlet chambers, a control chamber for receiving control fluid from the inlet chamber, and an electrically-actuated solenoid for controlling the fluid pressure in the control chamber so that in one condition of the solenoid, fluid pressure within the control chamber acts on the diaphragm to maintain the valve closed, and in a second condition, relieves the pressure on the control chamber to permit the diaphragm to deflect into the control chamber to open the valve, the improvement comprising:

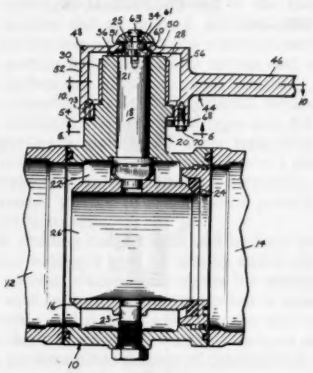
a self-cleaning filter assembly disposed in the inlet chamber of the valve, said filter assembly including a filter element through which control fluid from the inlet must flow to the control chamber, and a brush element engaging said filter element, said brush and filter elements being movable one relative to the other, and one of said brush and filter elements being coupled with the diaphragm so that upon movement of the diaphragm between the open and closed positions, said brush element sweeps the surface of said filter element to brush away deleterious material accumulated on said filter element, and the material is carried out of the valve by normal flow from the inlet chamber to the outlet chamber.

4,081,172

FLUID VALVE

William S. Thompson, Elkhart, Ind., assignor to Elkhart Brass Mfg. Co., Inc., Elkhart, Ind.

Filed Oct. 7, 1976, Ser. No. 730,168
Int. Cl. F16k *35/00*
U.S. Cl. 251—93 **9 Claims**



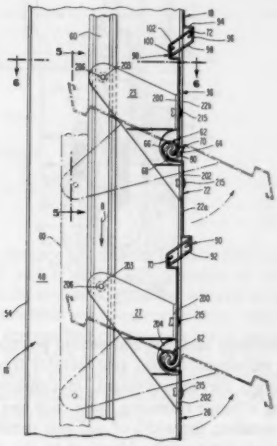
1. In a fluid valve having a housing, said housing having a chamber and an inlet into and an outlet from said chamber with a valve seat therebetween, a valve closure carried within said housing chamber between said inlet and outlet, said housing including a hub part having a bore extending therethrough into said housing chamber, a stem rotatably carried within said hub part bore, one end of said stem associated with said valve closure for shifting the closure between a closed position in fluid sealing contact with said valve seat and an open position allowing fluid communication between said housing inlet and outlet through the valve seat, handle means for shifting said valve closure between its open and closed positions, the improvement comprising connection means locating said handle means adjacent said hub part for rotative movement of the handle means relative to said stem, a lock member carried by said hub part, said lock member having a release position allowing the lock member to shift relative to the hub part and a normal lock position engaging the hub part to secure the lock member against movement relative to the hub part, a connector secured to said stem for rotative movement with the stem, said connector being anchored to said lock member for shiftable movement with the lock member, said handle means contacting said lock member for urging the lock member into its release position upon rotation of the handle means and causing said lock member and connector to shift as a unit to rotate said stem and shift said valve closure between its open and closed positions.

4,081,173

ROTATING BLADE FIRE DAMPER

Francis J. McCabe, 239 Hastings Ct., Doylestown, Pa. 18901

Filed May 26, 1976, Ser. No. 689,994
Int. Cl.² F24F *13/14*; F23L *13/08*; F16K *1/22*
U.S. Cl. 251—308 **2 Claims**



1. In an air control damper having a frame, at least one blade and rotation means for allowing selective rotational displacement of said blade with respect to said frame between an open and closed position, the improvement wherein said frame comprises an inwardly depending flange disposed within a plane which is parallel to the plane of said blade in the closed position, said inwardly depending flange being notched to form at least two hook-shaped hinge elements disposed on opposite sides of said frame, said hinge elements defining a surface having a hook-shaped cross-section; and wherein said rotation means comprises a hook-shaped hinge portion formed in said blade, said hinge portion being complementally configured to said hook-shaped hinge elements and slidingly engaging said hinge elements, said hook-shaped hinge elements and said hook-shaped hinge portion being so articulated as to facilitate the rotational displacement of said blade with respect to said frame; and wherein said blade is formed from a single, substantially uniform sheet of material to have defined therein said hinge portion, said hinge being disposed intermediate between the longitudinal edges of said material whereby first and second substantially parallel offset blade sections are formed, a first of which sections sealingly engages a first side of said inwardly depending flange in the closed position, said second section sealingly engaging the other side of said flange in the closed position, whereby a substantially continuous seal is formed between said frame and said blade in the closed position.

4,081,174

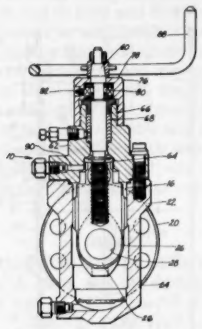
GATE VALVE

Thomas B. Johnson, Humble, and Larry D. Leva, Houston, both of Tex., assignors to Armco Steel Corporation, Middletown, Ohio

Filed Jan. 31, 1977, Ser. No. 764,379
Int. Cl.² F16K *3/316*
U.S. Cl. 251—327 **15 Claims**

1. In a gate valve of the type having a valve body formed

with a flow passage, a cylindrical valve chamber having a vertical axis formed in said valve body and intersecting said flow passage to define diametrically opposed inlet and outlet openings in said chamber, a gate member having parallel planar sealing surfaces and side edges and being disposed for movement within said valve chamber from a first position closing said flow passage to a second position wherein said flow passage is opened, and operating means extending through said valve body into said valve chamber and operatively connected with said gate member to move said gate



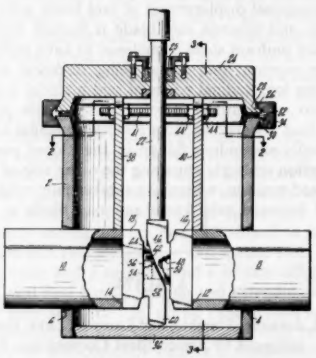
member between said first and second positions and arranged to permit movement of said gate member transversely to said flow passage, the improvement, in combination therewith, comprising a flange extending from each one of said edges of said gate member, the width of said gate member through said flanges being substantially identical to the diameter of said cylindrical valve chamber, and a relief on either side of said cylindrical valve chamber so positioned that said flanges are received therein when said gate member is in said first position, whereby said gate member is not guided in the closed position to eliminate any possible binding thereof.

4,081,175

GATE VALVE FABRICATED FROM PIPE

Thad M. Hasbrouck, Wethersfield, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 9, 1976, Ser. No. 749,207
Int. Cl.[2] F16K *3/316, 27/04*
U.S. Cl. 251—327 **5 Claims**



1. A gate valve including:

a cylindrical housing of a large diameter, said housing having aligned transverse openings therein and aligned pipe sections of smaller diameter than the housing welded in said transverse openings with the inner ends of the pipe sections in spaced parallel relation to each other,

spaced guide plates positioned in said housing and having opposed inner surfaces with these inner surfaces of the plates parallel to and aligned with the inner ends of the pipe sections,

a pair of valve discs spaced from one another and positioned between and guided by said plates for movement into and out of alignment with the pipe sections,

end closures at opposite ends of the cylindrical housing, one closure being removable, and

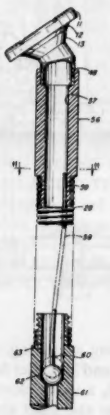
an actuating valve stem supporting said discs and extending through the removable end closures for moving the discs as a unit to open or close the valve, said guide plates extending between said pipe section ends and said removable end closure and in contact with both to be held in position thereby.

4,081,176

VALVE FOR AN ORAL EVACUATOR SYSTEM

W. Grant Johnson, 717 E. Chapman, Orange, Calif. 92667

Continuation-in-part of Ser. No. 592,140, Jul. 1, 1975, Pat. No. 4,015,336. This application Feb. 23, 1976, Ser. No. 660,081
Int. Cl.[2] F16K *31/00*
U.S. Cl. 251—342 **5 Claims**



1. An evacutor system adapted to communicate a negative pressure comprising:

a flexible axially resilient extensible hose member connected to the negative pressure; the hose member being radially bendable;

a first fitting member affixed to one end of the hose member having an internal bore for communicating the negative pressure and a valve seat located therein;

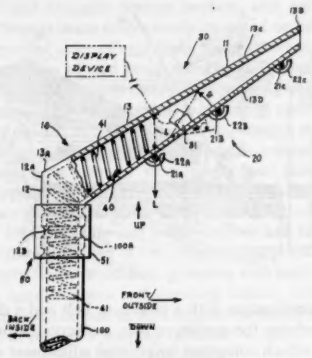
a valve poppet member operatively associated with the hose member normally in abutting sealed engagement with the valve seat; and

an axially stiff radially flexible wand member having one end connected to the valve poppet member and another end affixed to a second fitting member at another end of the hose member to retract the valve poppet member from abutting engagement with the valve seat only upon axial extension of the hose member.

4,081,177
BREAK-AWAY OUTRIGGER

Albert J. Graff, Arlington, Mass., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Mar. 10, 1977, Ser. No. 776,386
Int. Cl.[2] E04H 17/00
U.S. Cl. 256—12 4 Claims



1. An outrigger arm assembly adapted for use with a hollow upright fence post having a top end portion with a top end, comprising:

a. hollow outrigger arm configurated in the form of an upright portion and an inclined portion, wherein said upright portion has a top end and a bottom end and said inclined portion has a first end, a second end, an upper external surface and a lower external surface;

b. means, connected to said lower external surface of said inclined portion of said hollow outrigger arm, for holding and supporting a plurality of wires transverse to said inclined portion wherein said means includes a plurality of hooks connected, in spaced-apart relationship, to said lower external surface of said inclined portion of said hollow outrigger arm;

c. means, in abutting contact with said inclined portion of said hollow outrigger arm, for sensing movement of said inclined portion, wherein said means for sensing movement of said inclined portion comprises a sensor positioned within said inclined portion, with said sensor so disposed that it is activated when said inclined portion is moved a predetermined number of degrees from the normal inclination of said inclined portion;

d. means, disposed internal of said hollow upright fence post and said hollow outrigger arm, for maintaining said hollow outrigger arm in a preselected positional relationship with and to said hollow upright fence post;

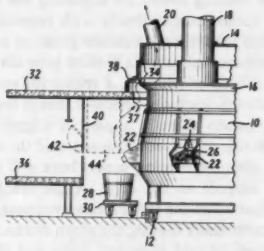
e. and, means for releasably holding together and supporting said top end portion of said hollow upright fence post and said bottom end of said upright portion of said hollow outrigger arm.

4,081,178
APPARATUS FOR COLLECTION OF TAPPING GASES FROM ELECTRIC SMELTING FURNACES

Leif Kopperstad, Fauske, and Halldor Opedal, Oslo, both of Norway, assignors to Elkem-Spigerverket A/S, Oslo, Norway

Filed Jan. 24, 1977, Ser. No. 761,529
Claims priority, application Norway, Feb. 2, 1976, 760323
Int. Cl.[2] C21C 5/52
U.S. Cl. 266—158 5 Claims

1. In an electric smelting furnace having a furnace pot, a furnace floor, a smoke hood positioned atop the furnace pot and the bottom of the smoke hood being spaced from the top of the furnace pot, a tapping spout in the side wall of the furnace pot below the furnace floor and a tapping hole through which molten metal is removed and tapping gases escape, the improvement comprising means for removing said tapping gases through said smoke hood without the need for auxiliary ventilation apparatus, said means comprising a substantial gap between the side wall of the furnace pot and the edge of the furnace floor and a plurality of arcuate screen-like members moveable with respect to each other, said screen-like members extending from the furnace floor to the bottom of the smoke hood whereby tapping gases tend to be drawn through said

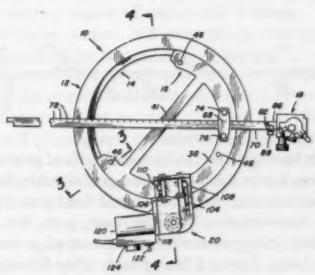


gap between the furnace pot and the furnace floor and up into the smoke hood and wherein said plurality of screens are present at least in the area of tapping and wherein said plurality of screens are moveable with respect to each other, each of said plurality of screens being a separate piece resting on the furnace floor of sufficient arcuate length to be free standing, and said screens being adapted to abutment end to end to form a continuous screen enclosure about a substantial portion of the furnace pot along its circumference.

4,081,179
CIRCLE CUTTER

Ronald A. Frame, 816 W. Hartford Pl., Broken Arrow, Okla. 74012

Continuation of Ser. No. 576,012, Aug. 8, 1975, Pat. No. 4,021,025. This application Aug. 30, 1976, Ser. No. 718,596
Int. Cl.[2] B23K 7/10
U.S. Cl. 266—70 1 Claim



1. A circle cutting apparatus for cutting circles and metal plates comprising;

a platform having a circular track means secured thereto, means for attaching the platform to the plate to be cut, track follower means comprising an arcuate member subtending greater than 180° movably attachable to the track means and capable of being moved completely around said track means, a cutting apparatus secured to the track follower means and operably engaged with the plate to be cut, a drive means operably connected between the circular track means and the track follower means for moving said track follower means around the circular track means, the circular track means comprising an inwardly extending flange secured to the platform, and including

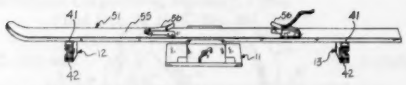
three horizontally disposed bearing means having axis of rotation parallel to the axis of the circular track means, said bearing means being interposed between the track follower means and the circular track means and being radially spaced through an angle greater than 180° to provide a three point suspension, centering means operably connected to the bearing means for radially adjusting the position of the bearing means for centering the track follower means with respect to the circular track means and including bearing positioning means operably connected to the bearing means for adjusting the position of said bearing means longitudinally with respect to its axis of rotation and wherein the centering means and bearing positioning means comprises a central bore through each bearing means axis of rotation, a recess for each bearing means provided in the track follower means for receiving said bearing means therein, a pair of aligned threaded bores on each side of the recess means, said threaded bores being larger than the bearing means bore and being positioned with respect to the edge of the track follower means such that when the track follower means is engaged with the circular track means, the mean distance between the axis of each of said threaded bores and the circular track means is substantially equal to the radius of the bearing means, a pair of oppositely disposed threaded screw members in each of said aligned bores, each pair of said screw members having inwardly directed tapered ends engageable with the bearing means bore for forcing said bearing means to center with respect to the screw members thereby forcing the outer edge of each bearing means outwardly against the circular track means and further being capable of adjusting the position of the bearing means longitudinally along its axis of rotation.

4,081,180

SKI HOLDING JIG

C. Johnny Munn, 69 S. Taft Hill Rd., Fort Collins, Colo. 80521

Filed Mar. 10, 1977, Ser. No. 776,160
Int. Cl.[2] B25B *1/20*
U.S. Cl. 269—88 6 Claims



1. A ski holding jig comprising:

a vise unit having a base, an upstanding fixed post secured to said base, a movable upstanding post slidably disposed on said base and connectable with said fixed post for securing a ski therebetween, wherein each post has an offset formed in its upper surface along one edge thereof, said offsets being disposed facing each other for supporting a portion of the ski thereon and for gripping a portion of the ski therebetween, said offsets having a substantially vertical face and a substantially horizontal face with said horizontal face disposed a predetermined distance above said base;

a pair of guide bars disposed normally to said posts, wherein said guide bars are secured to said fixed post, and through holes provided therefore in said movable post; and

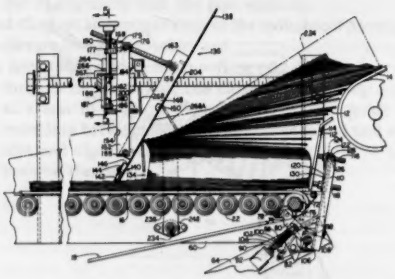
a pair of supporting structures separable from and disposed one on each side of said vise unit for supporting the ends of the ski, wherein said base projects longitudinally of said posts toward said supporting structures and each said supporting structure is a hexahedron having a top wall, a bottom wall, a top side wall, a bottom side wall, and a pair of side walls.

4,081,181

DISCRIMINATOR SUPPORTING ASSEMBLY

Norman P. Crowe, Miami Township, Clermont County, and Joseph M. Lohse, Terrace Park, both of Ohio, assignors to Multifold-International, Inc., Milford, Ohio

Filed Jan. 5, 1977, Ser. No. 759,711
Int. Cl.[2] B65H *1/30, 3/04*
U.S. Cl. 271—3.1 4 Claims



1. In combination with a conveyor belt and a discriminator plate overlying the conveyor belt, a discriminator supporting assembly which comprises lengthwise adjustment screw means extending lengthwise of the conveyor belt, a transverse mounting bar mounted on the lengthwise adjustment screw means and overlying the conveyor belt and advanceable along the lengthwise adjustment screw means, an elongated upright bracket mounted on the transverse mounting bar for movement toward and away from the conveyor belt, upright adjustment screw means connecting the transverse mounting bar and the bracket, spaced first and second support means mounted on the upright bracket, spaced first and second support means on the discriminator plate, means pivotally connecting the first support means of the upright bracket to the first support means on the discriminator plate, and plate swinging adjustment screw means connecting the second support means of the upright bracket to the second support means of the discriminator plate, whereby actuation of the lengthwise adjustment screw means advances the discriminator plate lengthwise of the conveyor belt, actuation of the upright adjustment screw means advances the discriminator plate toward and away from the conveyor belt, and actuation of the plate swinging adjustment screw means swings the discriminator plate with respect to the conveyor belt.

4,081,182

RIDABLE RECREATION DEVICE

Kevin P. O'Brien, 3541 SW. Vermont, Portland, Oreg. 97219

Filed Aug. 18, 1976, Ser. No. 715,393
Int. Cl.[2] A63B *5/00*
U.S. Cl. 272—114 7 Claims

1. A recreational device comprising:

(a) an upright body member of resilient material having an

upper seat portion, a lower bottom portion and a pair of opposing ellipsoidal sides;

(b) an elongate handle means mounted on the outer surface of said body member proximate said upper seat portion and extending upwardly from said body member; and

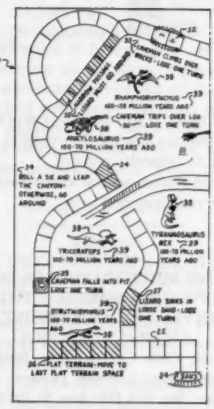
(c) a pair of foot support means each comprising a loop-shaped member having an elongate bottom portion and first and second upturned portions fastened at respective ends of said elongate bottom portion, said pair of foot support means being respectively mounted on said opposing ellipsoidal sides of said body member proximate said bottom portion of said body member such that said first upturned portions are in contiguous gripping contact with said opposing ellipsoidal sides, said second upturned portions are spaced outwardly in lateral relation to said opposing ellipsoidal sides and said elongate bottom portions are spaced downwardly from said upper seat portion, whereby said device and rider can be bouncingly propelled across solid terrain by a rider's sitting on said seat portion legs astraddle said body member and feet engaging said respective pair of foot support means with the legs in partially-flexed condition, grasping said body member by said handle means and exerting sudden compressive forces against said pair of foot support means by extending the legs in repeated jumping motions.

4,081,183

BOARD GAME APPARATUS

Joseph A. Urban, P.O. Box 2562, Livonia, Mich. 48151

Filed Feb. 14, 1977, Ser. No. 768,639
Int. Cl.[2] A63F *3/00*
U.S. Cl. 273—249 **10 Claims**



1. A game that creates a novel pursuit situation, said game comprising in combination:

a. a game board having marked thereon: a plurality of spaces in succession that constitute a primary path of progression about the board and includes a common starting space for the plurality of pursued playing pieces and a specific space of safety for said pursued playing pieces at the end of said path; a separate small plurality of spaces in succession that constitute a secondary path that is the initial starting path for the pursuing playing piece and has at one end of separate starting space for the pursuing playing piece, the other end of said path connecting directly with the first space of the primary path; a series of specific hazards and shortcuts in picture and legend situated along the primary path to be encountered by chance by the playing pieces and intended to impede or to expedite the movement of said playing pieces; a pictorial representation of various dinosaurs along with their respective names and approximate dates of their existence situated at various locations on the game board,

b. a plurality of playing pieces adapted to indicate the pursued Cavemen,

c. a singular playing piece adapted to indicate the pursuing Dinosaur,

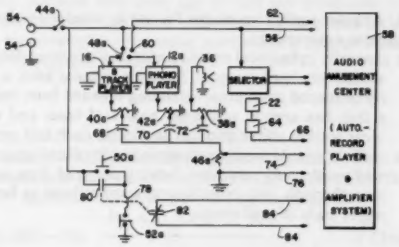
d. a conventional cubical die used to determine by chance the progress and thereby the fate of the playing pieces during the game.

4,081,184

AMUSEMENT APPARATUS

Shirley R. Brooks, 4858 W. Erie, Chicago, Ill. 60644

Filed Jun. 1, 1976, Ser. No. 691,512
Int. Cl.[2] G11B *17/22*
U.S. Cl. 274—1 R **8 Claims**



1. In a distantly located automatic coin operated record playing device, said distantly located automatic coin operated record playing device having an audio amplifier and a record changing apparatus responsive to externally supplied record changing programming information and a plurality of phonograph records, the improvement comprising:

a. a remote control unit, said remote control unit having a housing,

b. cartridge tape playing means, said cartridge tape playing means affixed to said housing,

c. phonograph record playing means, said phonograph record playing means affixed to said housing,

d. microphone means, said microphone means electrically connected to the interior of said housing,

e. independent volume control means for independent control of the amplitude of the audio signals generated by said microphone means and said cartridge tape playing means and said phonograph record playing means,

f. combined audio amplitude control means for simultaneously controlling said audio signals generated by said microphone means and said cartridge tape playing means and said phonograph record playing means,

g. pause means for selectively delaying the operation of said record changing apparatus,

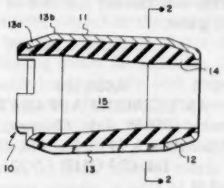
h. release means for negating said pause means, said release means permitting said record changing apparatus to become operative, and

i. electrical interconnection means extending between said housing and said distantly located automatic coin operated record playing device and electrically coupling said remote control unit and said cartridge tape playing means and said phonograph playing means and said microphone means and said independent volume control means and said combined audio amplitude control means and said pause means and said release means together, whereby said phonograph playing means, and said microphone means and said cartridge tape playing means may be selectively operated individually and in combination with one another.

4,081,185
OIL WELL SWAB CUP

John Jay Lane, Dallas, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Jul. 23, 1976, Ser. No. 708,238
Int. Cl.² F16J 15/32
U.S. Cl. 277—212 C 13 Claims

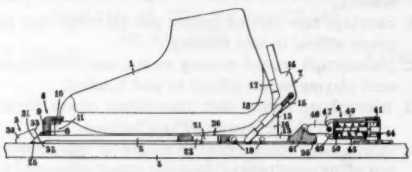


1. Annular sealing apparatus for use in tubular conduit, said apparatus comprising:
a generally cylindrical outer reinforcing structure formed of a relatively hard material, having a circular base, a plurality of spaced apart arms extending upward from said base, a thin flex area in said arms near said base, and a thick wear section above said flex section in each said arm; and,
a resilient annular sealing element inside of and attached to said reinforcing structure, having an axial bore opening therethrough, and extending upward at least as far as the upper ends of said arms.

4,081,186
SAFETY SKI BINDING

Jean Joseph Alfred Beyl, Boulevard Victor Hugo, Nevers, Nievre, France

Filed Jan. 20, 1976, Ser. No. 650,745
Claims priority, application France, Jan. 28, 1975, 75 02536; Apr. 2, 1975, 75 10224
Int. Cl.² A63C 9/08
U.S. Cl. 280—618 23 Claims

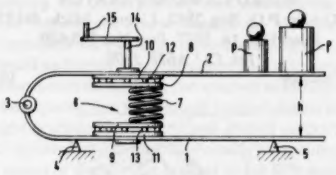


1. A safety ski binding comprising:
a plate adapted to act as a support means to a ski boot;
at the toe end and heel end of said plate, fastening means capable of holding the relevant end portions of said boot on said plate, respectively;
pivot means secured to the ski, and means for mounting said plate on said pivot means for permitting linear and pivotal movement of said plate from said normal position on said ski and for permitting detachment of said plate from said ski;
retaining means for normally retaining one end of said plate on said ski, said means being secured to the ski;
a pivot member secured to the ski surface adjacent the other end of said plate and extending upwardly from said surface;
a case rotatably mounted about said pivot member;
at least one resilient means in said case;
a lock bolt registering with said other end of said plate and pivotally mounted on said case for permitting vertical release of said plate;
said resilient means being substantially parallel to said ski surface and coacting with said lock bolt urging the lock bolt into a position parallel to said ski surface, and said resilient means further coacting with said pivot member for continuously urging said case toward a first position to hold said plate in parallel relationship with respect to the longitudinal axis of the ski;
a slideway in said plate for receiving said lock bolt, said slideway being longer than the part of said lock bolt registering with said slideway when said lock bolt is in said slideway and said plate is in its normal position on said ski to permit longitudinal movement of said plate on said ski, said slideway having one or more selectively shaped wall portions therein extending along the longitudinal direction of said slideway for controlling the vertical and horizontal release of said plate during excessive stress generated during skiing, the resilient means, the lock bolt and the slideway forming a resilient system for controlling movement of said plate toward said lock bolt.

4,081,187
SPRINGING DEVICE PARTICULARLY FOR VEHICLES

Herbert Evertz, Speckbahn 63, D-581 Witten-Herbede, and Hans Peter Geis, Am Hee 21, Witten-Herbede, both of Germany

Filed Jan. 28, 1976, Ser. No. 653,252
Claims priority, application Germany, Aug. 27, 1975, 2538103
Int. Cl.² B60G 11/14
U.S. Cl. 280—701 9 Claims

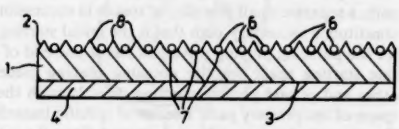


4. As a new product, a spring unit comprising:
a. two thrust bearings aligned for rotation about a common axis, fastened to opposite ends of
b. a helical spring whose central axis is parallel to but eccentric from the said common axis.

4,081,188
PAPER HAVING MICROCAPSULES DEPOSITED IN DEPRESSIONS ON A SURFACE THEREOF HAS IMPROVED SMUDGE-RESISTANCE CHARACTERISTICS

Lawrence Westcott, Cefn Cribwr, near Bridgend, Wales, assignor to Wiggins Teape Limited, London, England

Continuation of Ser. No. 504,189, Sep. 9, 1974, abandoned. This application Sep. 17, 1976, Ser. No. 724,696
Claims priority, application United Kingdom, Sep. 13, 1973, 43123/73
Int. Cl.² B32B 3/16; B41L 1/36; B41M 5/16, 5/22
U.S. Cl. 282—27.5 4 Claims



1. In a coated paper for use in pressure sensitive copying

systems of the type which includes (A) a copying system comprising an upper sheet which is coated on its lower surface with pressure rupturable microcapsules containing a color former material, and a lower sheet coated on its upper surface with a color reactant material, and (B) a copying system as described in (A) which additionally comprises at least one intermediate sheet which is coated on its lower surface with microcapsules and on its upper surface with color reactant material, the improvement which comprises the coated paper being a machine glazed base paper having a smooth glazed surface and a rough surface having a Bendsten roughness of between about 700 and 1000 ml/min. and having a color reactant on the smooth glazed surface of the base paper when it functions as a lower sheet and having a microcapsule coating on the rough surface of the base paper, when it functions as an upper sheet, and having a color reactant on the smooth glazed surface of the base paper and a microcapsule coating on the rough surface of the base paper when said paper functions as an intermediate sheet, the rough surface of the paper being characterized by protrusions which extend farther from the body of the paper than microcapsules carried on said rough surface side of the paper.

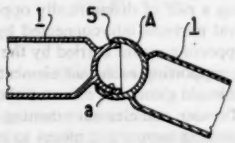
3. In pressure sensitive copying systems of the type which includes (A) a copying system comprising an upper sheet which is coated on its lower surface with pressure rupturable microcapsules containing a color former material, and a lower sheet coated on its upper surface with a color reactant material, and (B) a copying system as described in (A) which additionally comprises at least one intermediate sheet which is coated on its lower surface with microcapsules and on its upper surface with color reactant material, the improvement which comprises the upper, lower and intermediate sheet being a machine glazed base paper having a smooth glazed surface and a rough surface having a Bendsten roughness of between 700 and 1000 ml/min. and having a color reactant on the smooth glazed surface of the base paper when it functions as a lower sheet and having a microcapsule coating on the rough surface of the base paper, when it functions as an upper sheet, and having a color reactant on the smooth glazed surface of the base paper and a microcapsule coating on the rough surface of the base paper when said paper functions as an intermediate sheet, the rough surface of the paper being characterized by protrusions which extend farther from the body of the paper than microcapsules carried on said rough surface side of the paper.

4,081,189

SECTIONAL IRON FOR ARTICULATED FITTING, MORE PARTICULARLY FOR A VEHICLE BODY STRUCTURE

Jean-Claude Dumas, Velizy-Villacoublay, France, assignor to Societe Generale de Constructions Electriques et Mecaniques Alsthom S.A., Paris, France

Filed Mar. 24, 1976, Ser. No. 670,008
Claims priority, application France, Mar. 28, 1975, 75 09968
Int. Cl.[2] F16L *39/00*
U.S. Cl. 285—137 R **3 Claims**



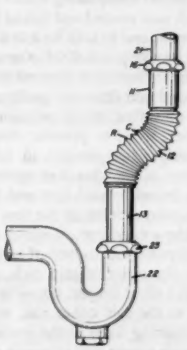
1. An assembly adapted for mounting in a vehicle body structure, comprising: a first member; a second member joined edgewise to said first member; said first member having a female fastening portion extending longitudinally along an edge thereof provided with a longitudinally extending cylindrical bore and a longitudinally extending slot defined by a pair of lips and being outwardly directed from said first member to provide edgewise access into said bore; said second member being provided with a male fastening portion extending longitudinally along an edge thereof and an outer cylindrical surface of substantially the same diameter as said bore, said outer cylindrical surface extending over a predetermined arc of a cylinder, being operable through a neck portion with shoulders, said neck portion and shoulders connecting said male member to said second member, said neck portion extending over a fraction of said arc; the width of said slot in said female fastening portion, the predetermined arc and the width of said neck portion, being so disposed whereby said male fastening portion is engageable with said female fastening portion, without deformation of either fastening portion when one of said lips of said slot is in contact against a shoulder of said neck portion whereby the respective cylindrical axes are substantially coincident, said members being rotatable about their common axis to enable engagement between the respective fastening portions with both lips of said slot positioned over respective parts of said outer cylindrical surface; and locking means for locking the fastening portions at a desired relative angular disposition of said member.

4,081,190

PLUMBING DEVICE

Daniel Itzler, 370 Chestnut Dr., Roslyn, N.Y. 11576

Continuation-in-part of Ser. No. 551,294, Feb. 20, 1975. This application Mar. 22, 1976, Ser. No. 668,964
Int. Cl.[2] F16L *27/00*
U.S. Cl. 285—226 **4 Claims**



1. A plumbing device for connecting a fixed sink tailpiece to a trap out of alignment therewith but having an axis parallel to the axis of the sink tailpiece, said device including a tubular unitary member of plastic having an upper section to snugly receive the tailpiece, the upper section having an externally threaded end portion, and means including a nut and a washer cooperating with said threaded end portion for forming a seal to the tailpiece, said member having a cylindrical lower section to be snugly received in the trap and having a pleated flexible blow-molded section connecting said upper and lower sections, said lower section being of substantial wall thickness and being rigid so that it can be cut with a hacksaw while said lower section is held in the hand and so that it can resist compression by seal-forming means of the trap, the wall thickness of said pleated section being a minor fraction of the wall thickness of the lower section, the wall of said blow-molded pleated section comprising substantially less material per inch along its axis in its as-molded condition than the amount of material per inch along the axis of said lower section for enhancing the pliability of said pleated section, said upper section being cylindrical and having an external diameter of about 1¼ inches and a length of about 1 to 3 inches, said pleated section being about 2 to 5 inches long and being capable of being distorted so that said upper section and said lower section connected thereto

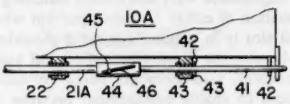
may be maintained out of alignment but parallel, said lower section being about 4 to 8 inches long and being cylindrical and having an external diameter of about 1¼ inches, said plastic member being of polyolefin resistant to alkaline drain cleaners.

4,081,191

TRUCK DOOR LOCK

Matthew Capozello, 134-28 218th St., Springfield, N.Y. 11413

Filed Mar. 1, 1976, Ser. No. 662,695
Int. Cl.² E05C 3/06
U.S. Cl. 292—197 1 Claim



1. A lock assembly for latching or unlatching the door of a truck body attached to a tractor, said assembly linked to a control means in the cab of the tractor and joined to a door latch means in the truck body,

said control means comprising a lever pivotally mounted in the cab and pivotally linked to a first rod that extends under the truck body, said first rod slidably mounted in a bearing fixed to said truck body such that rotational movement of the lever causes axial movement of the said first rod,

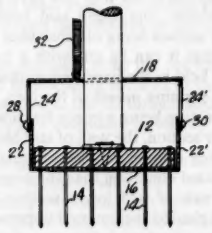
said door latch means comprising a lock bolt member fixed to a second rod, said second rod linked to said first rod and fixed at its exterior end to said lock bolt member, said lock bolt member extending radially to the said second rod and a bracket member fixed to a door of the truck body so as to project beyond said door in a position in which the lock bolt member in a first radial position engages the said bracket member, so as to prevent opening of said door, and in a second radial position in which the lock bolt member is clear of said bracket member, in which said second rod is linked to said first rod by coupling means that translates axial motion of the first rod into rotational movement of the second rod, in which the coupling means comprises a sleeve fixed to one of said rods and slidably mounted over the other of said rods, said sleeve formed with a through helical shaped slot which engages a detent radially fixed to the said other rod, with the second rod mounted in a bearing fixed to the truck body, said second rod having flange means that prevents axial movement but accomodates rotational movement of said second rod.

4,081,192

TRASH PICKER

Floyd S. Jones, 3033 Cheek Rd., Durham, N.C. 27704

Filed Nov. 2, 1976, Ser. No. 738,273
Int. Cl.² A01D 9/06
U.S. Cl. 294—61 1 Claim



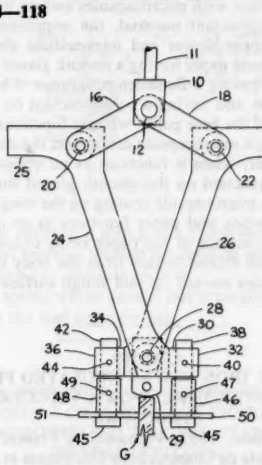
1. A trash picker comprising a handle, a block secured to one end of said handle normally disposed thereto, a plurality of spikes mounted in said block to extend normally therefrom in a direction remote from said handle, a stripper plate movable from a retracted to an extended position and having a plurality of holes therein to accommodate said spikes that pass therethrough, first end flanges disposed on said stripping plate which flank said block and extend upwardly towards said handle, second end flanges slidably disposed over said first end flanges, screw and longitudinally extending slot means to adjustably fasten said first and second end flanges together enabling the user to vary their combined extent, a pressure plate connected to said second end flanges at an area remote from and parallel to said stripper plate overlying a portion of said handle and above said block, and spring means connected from said handle to said pressure plate so that said stripper plate is normally in the retracted position contiguous with the block to leave said spikes exposed the stripper plate being adjustable so that it would extend almost, but not quite to the extreme points of the spikes clearing the same.

4,081,193

TONGS FOR GRIPPING THIN GLASS SHEETS

George A. Iiams, Tiro, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Apr. 15, 1977, Ser. No. 787,826
Int. Cl.² B66C 1/48
U.S. Cl. 294—118 7 Claims



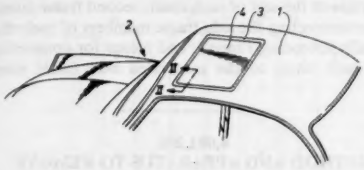
1. Self-closing tongs for gripping a glass sheet during thermal processing comprising a pair of glass engaging elements of modified disc-like configuration carried by said tongs and movable into glass engaging positions against the opposite major surfaces of said glass sheet when said tongs are freely suspended, each of said glass engaging elements having a periphery comprising a pair of diametrically opposite convexly rounded peripheral portions interconnected by straight portions, element supporting means carried by the lower portion of said tongs for supporting each said element including pin means about which said element is mounted about its approximate geometrical center, and element orienting means cooperating with said element supporting means to support its said associated element in one of two approximately diametrically opposed orientations so that one of said convexly rounded peripheral portions of each of said glass engaging elements opposes one of said convexly rounded peripheral portions of said other glass engaging element to engage said gripped glass sheet therebetween and the straight peripheral portions of said elements are out of contact with said gripped glass sheet.

4,081,194

WIND DEFLECTOR ARRANGEMENT ON A MOTOR VEHICLE ROOF

Hans Jardin, Inning, Germany, assignor to Webasto-Werk W. Baier GmbH & Co., Germany

Filed Feb. 10, 1977, Ser. No. 767,321
Claims priority, application Germany, Feb. 26, 1976, 2607816
Int. Cl.[2] B60J *1/20, 7/22*
U.S. Cl. 296—1 S 8 Claims



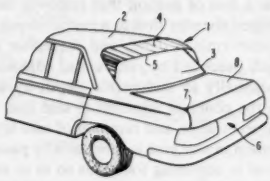
1. Wind deflector arrangement in a motor vehicle panel with a panel cutout, closeable by a sliding cover, with the wind deflector mounted along the forward edge of the panel cutout and swivelable around an axis located crosswise to the longitudinal axis of the vehicle, said wind deflector being connected with lever arm means rotatably mounted in a lateral panel support frame part, said wind deflector being raised by spring force when the sliding cover is opened and lowered when the sliding cover is closed by having a member connected with the sliding cover running on the lever arm means, a track mounted in the panel support frame, said sliding cover being guided in said track by means of a forward guide shoe, said shoe being connected with the sliding cover by a guide shoe bracket, said lever arm means being mounted below the guide shoe bracket in the slide path of the guide shoe.

4,081,195

MOTOR VEHICLES WITH STEPPED REAR SECTIONS

Hans Götz, Boblingen, Germany, assignor to Daimler-Benz Aktiengesellschaft, Germany

Filed Aug. 11, 1976, Ser. No. 713,582
Claims priority, application Germany, Aug. 12, 1975, 2535882
Int. Cl.[2] B62D *35/00*
U.S. Cl. 296—1 S 7 Claims



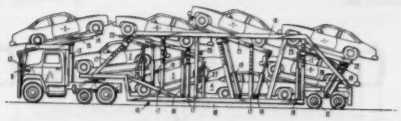
1. A motor vehicle with a rear section having a roof and a rear window, and means for producing a predetermined air stream for reducing vorticization in the area of the rear window, said means for producing a predetermined air stream comprising a convex screen-like guide means extending in continuation of the roof outwardly from the area of the perimeter of the rear window and overlying a portion of the rear window, characterized in that the convex guide means surrounds at least approximately the upper half of the perimeter of the rear window and has at least an edge conforming in shape thereto.

4,081,196

AUTOMOTIVE VEHICLE TRANSPORT SYSTEM

Ernest M. Dandridge, Jr., 631 Eagle Ave., Charles Town, W. Va. 25414

Filed Oct. 20, 1976, Ser. No. 734,108
Int. Cl.[2] B62D *39/00*
U.S. Cl. 296—1 A 21 Claims



1. A transportation vehicle carrier adapted for transporting eight compact passenger vehicles within a length of about 55 feet and a height of about 13½ feet, said passenger vehicles having a length of about 187 inches to 197 inches, a roof height of about 52 inches to 54 inches, and a wheel base of 103.0 inches to about 111.0 inches comprising in combination:

a. a tractor having a main frame with a cab at the front end thereof, a coupling reception means at the rear end thereof and a horizontally extending upper vehicle supporting ramp on the tractor in connection with said frame extending over said cab, said ramp having a substantially horizontally extending track therefrom and;

b. a trailer having a frame possessing at least one axle at the rear portion thereof and a coupling means at the front portion thereof to couple said trailer to said tractor, said trailer comprising:

i. a bottom section comprising a front lower ramp and a back lower ramp wherein said front lower ramp is vertically adjustable to maintain one of said passenger vehicles at an angle of from about 35° to about 50° and wherein each of said ramps contains one of said passenger vehicles;

ii. an intermediate section comprising an intermediate front ramp and an intermediate rearward back ramp wherein said intermediate ramps are vertically adjustable to an angle of from about 5° to 25° and wherein said intermediate front ramp is disposed to carry one of said passenger vehicles with a portion thereof disposed above said passenger vehicle disposed within said front lower ramp and said rearward intermediate ramp is disposed to carry one of said passenger vehicles with a portion thereof disposed above said passenger vehicle disposed within said bottom section back lower ramp; and,

iii. an upper section comprising an upper front, upper middle and upper back ramp wherein said upper back ramp possesses a substantially horizontally adjustable planar track supporting surface telescoping in the direction of said cab and said upper front and upper middle ramps possess a substantially horizontal bidirectional extending planar track supporting surface and wherein each of said three upper ramps contains one of said passenger vehicles.

4,081,197

FLOOR TUNNEL STRUCTURE FOR MOTOR VEHICLES

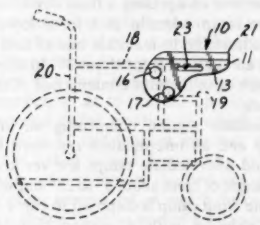
Sabet Ackel, Stuttgart, Germany, assignor to Daimler-Benz Aktiengesellschaft, Germany

Filed Jul. 23, 1975, Ser. No. 598,229
Claims priority, application Germany, Jul. 24, 1974, 2435545
Int. Cl.[2] B62D *21/00*
U.S. Cl. 296—28 R 16 Claims

1. A tunnel structure for a floor of a motor vehicle, which includes tunnel edge reinforcing means forming a hollow bearer means along each lower tunnel edge, the tunnel reinforcing means including sheet metal reinforcing members each having parallel flange means, traverse means extending over an

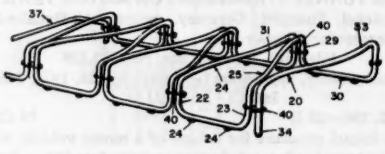
open tunnel side and adapted to support drive unit parts, bolt means and nut means for connecting said traverse means to the parallel flange means at different longitudinal positions along the parallel flange means, connecting aperture means for the bolt means of the threaded connection being provided at different longitudinal positions along the parallel flange means, and nut insert aperture means coordinated to the connecting aperture means being provided in the reinforcing means for the connecting nut means of the threaded connection, edges of the nut insert aperture means having a predetermined spacing from a profile edge of the tunnel reinforcing means thereby leaving an edge web with the spacing corresponding at least approximately to 1½ times the thickness of the sheet metal reinforcing members.

4,081,198
TRAY FOR TUBULAR ARMCHAIR
Richard C. Penney, 430 W. Mendota Rd., W. St. Paul, Minn. 55118
Filed Feb. 4, 1977, Ser. No. 765,535
Int. Cl.² A47B *39/00*
U.S. Cl. 297—153 **7 Claims**



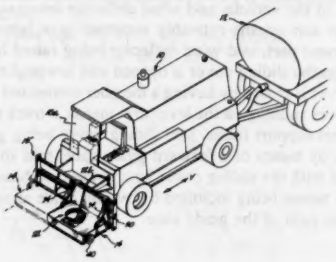
1. A tray assembly adapted for removable attachment to a wheel chair, comprising a flat base, two supporting wings one at each side of and perpendicular to said base, and knobs extending laterally from each of said supporting wings in position to provide cantilever support from the arms of said chair to said tray by bearing against opposite sides of said arms, at least the knobs of at least one of said wings being movable toward and away from the other of said wings so as to permit said removable attachment.

4,081,199
CHAIR GROUPING
Leif Blodee, 293 S. Lakeshore Dr., Holland, Mich. 49423
Filed Jun. 2, 1977, Ser. No. 802,719
Int. Cl.² A47C *1/12*
U.S. Cl. 297—232 **8 Claims**



1. In a grouping of chairs in side-by-side relation, the improvement comprising: chair means forming a seat and a back for each chair; a frame comprising a plurality of tubular frame elements for each chair including a U-shaped front runner extending along the floor beneath said chair and formed upwardly at the sides thereof, and first and second side frame members extending respectively from the ends of said front runner about the sides of said chair, and a pair of laterally extending runners behind each chair; first frame connector means for connecting the front runners of adjacent chairs together and for connecting said front runners to the side frame elements of adjacent chairs and for supporting the forward portion of the seat of each chair; second frame connector means for connecting the side frame members of each chair to the laterally extending runners; and means for connecting the back of each chair to the associated side frame members thereof.

4,081,200
METHOD AND APPARATUS TO REMOVE STRUCTURAL CONCRETE
John B. Cheung, Bellevue, Wash., assignor to Flow Industries, Inc., Kent, Wash.
Filed Dec. 10, 1976, Ser. No. 749,215
Int. Cl.² E01C *23/09*; E21C *37/06*
U.S. Cl. 299—17 **17 Claims**



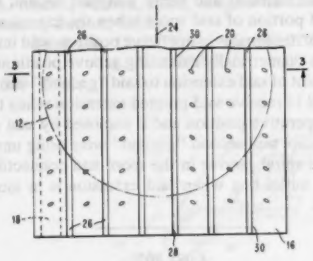
1. The method of removing from a concrete structure an area of structural concrete extending inwardly through levels of aggregate to predetermined depth, comprising directing against the concrete water jetted to impinge the same under pressure in the range above substantially 25,000 pounds per square inch in at least one or more separate impinging streams having an energy level created by such pressure sufficient to erode and remove the concrete to such depth, each such stream having a lesser cross-sectional width in any direction than the width of such area measured in said direction, progressively advancing each impinging stream across said area in concrete in a line of motion that removes the structural concrete impinged thereby first to a partial depth a minor fraction of said predetermined depth and thereafter to said predetermined depth preceded by removal of adjacent structural concrete substantially to said partial depth by such jetted water impinging the concrete adjacent to said line, whereby continued depth penetration and removal of said layers of aggregate at one location in said area is substantially paced by penetration and removal in adjoining locations so as to maintain openness around any such locations for escape of aggregate particles without substantially impeding the directness of such jetted water impingement on the concrete.

4,081,201
WAFER AIR FILM TRANSPORTATION SYSTEM
Javathu Kutikaran Hassan, Hopewell Junction, and John Angelo Paivanas, Hyde Park, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Dec. 27, 1976, Ser. No. 754,306
Int. Cl.² B65G *51/02*
U.S. Cl. 302—2 R **9 Claims**

1. A method of controlling the motion of objects such as

semiconductor wafers along a surface of an elongated track on a bed of air comprising:

emitting air against one side of the object from a plurality of rows of jets positioned longitudinally along the track with openings in the surface of the track and passages to the surface which are at least four times longer than the diameter of the openings and which are inclined towards each other in opposing pairs made up of jets from different



rows to define the path of travel for the objects positioned over the jets; and

evacuating air introduced by each row of jets from the surface of the track over the side of a channel extending longitudinally along the track in the surface of that track which side is spaced alongside the row in the direction of inclination of the passages of the jets and which side is curved to cause a Coanda effect.

4,081,202

NOISE REDUCTION DEVICE FOR A CHAIN DRIVE MECHANISM

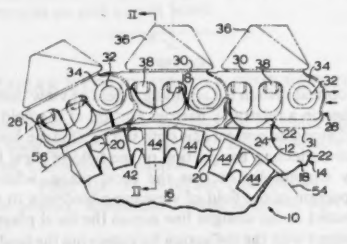
Nsoto Kozuki, Sagamihara, Japan, assignor to Caterpillar Mitsubishi Ltd., Tokyo, Japan

Filed Nov. 18, 1976, Ser. No. 742,975

Claims priority, application Japan, Jan. 26, 1976, 51-007252

Int. Cl.² B62D *55/12*

U.S. Cl. 305—57 **8 Claims**



1. An improved noise reduction device for a chain drive mechanism having a rotatable sprocket with a plurality of peripheral teeth thereon, a chain having a plurality of pivotally coupled links arranged in opposite pairs and a plurality of teeth engaging members trained around the sprocket, wherein the improvement comprises:

means mounted on the sprocket for resiliently making sequential radial outward engagement with the chain and for reducing the contact noise between the teeth engaging members and the sprocket teeth, said means including a deflectable plate spring having a curved portion in cross section.

4,081,203

DRILL STRING STABILIZER

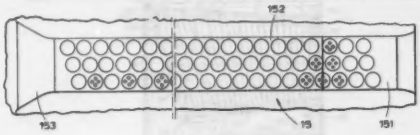
John Michael Fuller, Cheltenham, England, assignor to L. M. van Moppes & Sons Limited, Basingstoke, England

Filed May 4, 1976, Ser. No. 682,971

Claims priority, application United Kingdom, May 6, 1975, 18998/75

Int. Cl.² F16C *1/26*

U.S. Cl. 308—4 A **16 Claims**



1. An improvement in a stabilizer of the type having integral steel blades with preformed apertures into which are cold pressed plugs of hard material, the improvement comprising diamonds embedded in some of the plugs, said some plugs being less in number than the total number of plugs so that some plugs have diamonds embedded therein and the remaining plugs are free of diamonds, said diamonds each having a size between 1/20 and 2 carats and each being located at a plug outer surface to be presented outwardly of the blade.

4,081,204

BALL BEARINGS AND BALL RACES

Rudolf Bauer, Herzogenaurach; Dieter Goppelt, Aurachtal; Hans-Christian Krüger, and Max Pfitscher, both of Herzogenaurach, all of Germany, assignors to Industriewerk Schaeffler OHG, Herzogenaurach, Germany

Filed Apr. 14, 1976, Ser. No. 677,037

Claims priority, application Germany, Apr. 24, 1975, 2518129

Int. Cl.² F16C *33/58*

U.S. Cl. 308—216 **29 Claims**

1. A race for radial ball bearings comprising a single thin-walled tubular element having two axial ends and provided on at least one axial end with a rolled bead with a substantially circular outer contour on which the balls of the bearing roll.

4,081,205

DISPLAY CART ASSEMBLY

Arthur F. Rosenacker, Cincinnati, Ohio, assignor to Consolidated Foods Corporation, Chicago, Ill.

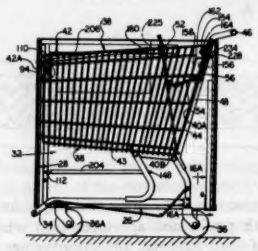
Filed Jan. 19, 1977, Ser. No. 760,530

Int. Cl.² A47B *55/00, 71/00*

U.S. Cl. 312—250 **2 Claims**

1. The combination of a shopping cart including a basket formed of wire members with spaces therebetween, a framework supporting the basket, and wheels supporting the framework with a pair of upright side panels, fastener means mounted on the side panels and extending through spaces in walls of the basket to rest on wire members of the basket for releasably supporting the side panels on opposite sides of the basket, a pair of upright end panels, each of the end panels

spanning opposed end portions of the side panels, tension spring members extending crosswise of the shopping cart and linking the side panels to cause the side panels to engage the end panels, tension spring members extending lengthwise of the shopping cart and linking a first one of the end panels to the side panels to hold the first one of the end panels against the side panels, a tension spring member attached at its ends to a



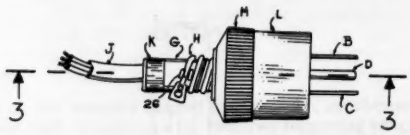
second one of the end panels and overlying a handle portion of the shopping cart to hold the second one of the end panels against the side panels, a refrigerated container including a central cup-shaped portion and outwardly extending horizontal flange portions, and support means mounted on the side panels, the flange portions overlying the support means to support the refrigerated container with the cup-shaped portion extending into the interior of the basket.

4,081,206

ELECTRIC PLUG WITH RETRACTABLE GROUND TERMINAL

Hop Lee, 2455 - 24th Ave., San Francisco, Calif. 94116

Filed Feb. 17, 1977, Ser. No. 769,839
Int. Cl.² H01R *3/06*
U.S. Cl. 339—14 P **1 Claim**



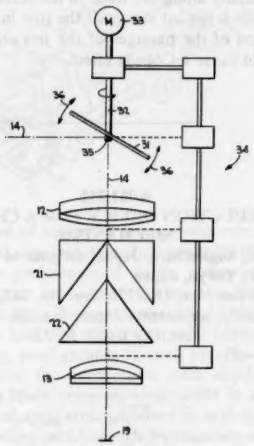
1. In an electric plug:
(a) a cable supporting carrier having a central cable receiving bore and three radially extending and spaced apart yokes for receiving two electric current carrying wires and a "ground" wire;
(b) a cover disc for clamping portions of the three wires in their associate yokes with the end portions of these wires extending beyond said yokes;
(c) an inner cylindrical body having three slots in its wall for receiving the ends of the three wires and having three longitudinally extending bores with a passage to the body slots;
(d) two electrode terminals positioned in two of the inner body bores and having wire securing means for securing the ends of the two electric wires to these two terminals;
(e) a "ground" terminal received in the inner body third bore and having wire securing means at one end for securing the end of the "ground" wire thereto, the opposite end of said "ground" terminal pivotally supporting an extension that can be swung from operative position where the extension is in alignment with the length of said "ground" terminal, into an inoperative position where the extension is at right angles to the length of the "ground" terminal;
(f) an enclosure for said carrier, cover disc and inner body consisting of two separable parts, a cylindrical end cap housing said inner body and said cover disc and having three openings in its closed end for receiving the two electrode terminals and the "ground" terminal pivoted extension when the latter is in operative position, and a top cap removably secured to said end cap and enclosing said carrier, said carrier having an integral "ground" wire receiving spool extending through an opening in said top cap; and
(g) a "ground" wire having one end connected to said "ground" terminal and being wrapped around a helical grooved portion of said spool when the extension of said "ground" terminal is in operative position, said inner body having a diametrically extending groove positioned at the pivot point of said extension to said "ground" terminal and designed to receive said pivoted extension when the latter is in inoperative position and is enclosed by said cylindrical end cap, said second "ground" wire being unwrapped from the spiral groove in the spool and connectible to an electric outlet box when said extension is in inoperative position.

4,081,207

SCANNING LENS SYSTEM

Charles Dippel, Lockland, Ohio, assignor to Cincinnati Electronics Corporation, Cincinnati, Ohio

Filed Jul. 1, 1976, Ser. No. 701,494
Int. Cl.² G02B *27/17, 23/02, 9/34, 5/04*
U.S. Cl. 350—6.4 **14 Claims**



9. An optical system for scanning a field of view onto a focal plane wherein a relatively narrow portion of the field of view is imaged along an optical axis onto the focal plane comprising means for deflecting the portion of the field of view in a substantially straight line across the focal plane, whereby the imaged portion of the field of view has a tendency to rotate as it is deflected in the straight line across the focal plane, means synchronized with the deflection for removing the tendency for the field of view to rotate, said last named means including: a pair of beam reflectors having axes coincident with each other and the optical axes of the means for imaging, a first of said reflectors having: a first internal reflecting surface sloping at a predetermined angle in a first direction with respect to the axis of the reflectors, a second internal reflecting surface parallel to the axis of the reflectors, said first surface being transparent to the image reflected from the second surface; the second reflector having: a third internal reflecting surface sloping at the predetermined angle in a second direction with respect to the axis of the reflectors, the first and second directions being opposite from each other, whereby an image projected through the first surface is reflected by the third surface and is

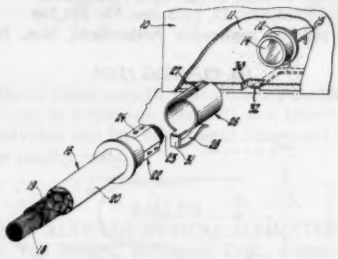
projected from it parallel to the axis of the reflection; and a lens system having an optical axis coincident with the optical axis of the reflectors for focusing the image projected from the reflectors onto the focal plane.

4,081,208

OPTICAL AND ELECTRICAL CONDUIT TERMINATION MEANS FOR CIRCUIT BOARD

Robert A. Meade, Warren, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Jan. 17, 1977, Ser. No. 759,719
Int. Cl.[2] G02B 5/16
U.S. Cl. 350—96.20 **1 Claim**



1. Apparatus for use in a vehicle mounted optic multiplexing system to terminate an electric power conduit and an optic signal conduit at a circuit board containing electrical and optic apparatus adapted to receive electric power and optic signals, respectively, from said electric power and optic signal conduits, said apparatus comprising, in combination:

a generally cylindrical, electrically conducting ferrule on the end of the optic signal conduit, the ferrule having means engaging, in electrical contact, the electric power conduit;

an electrically conducting, hollow, generally tubular receptor on the circuit board, said receptor having an integral extending tab bent backward along the receptor as a clip for connection to the board and to the electrical apparatus thereon, the receptor being adapted to receive the ferrule axially therein, in electrical communication therewith, and to thus retain the ferrule in alignment with said optic apparatus, whereby electric power and optic signals are supplied from the electric power conduit and the optic signal conduit, respectively, to the electrical and optic apparatus on said circuit board.

4,081,209

HEADGEAR WITH SPHERICAL SEMI-REFLECTING SURFACE

Fritz Peter Heller, Bromley, and Stafford Malcolm Ellis, Maidstone, both of England, assignors to Elliott Brothers (London) Limited, Chelmsford, England

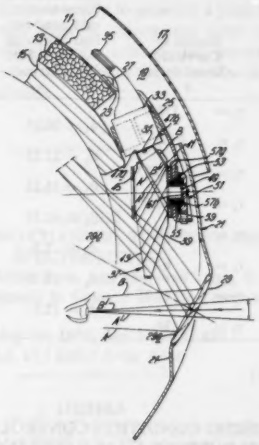
Filed Apr. 27, 1976, Ser. No. 680,746
Claims priority, application United Kingdom, Apr. 29, 1975, 17812/75
Int. Cl.[2] G02B 27/14
U.S. Cl. 350—174 **8 Claims**

1. Headgear for the occupant of a vehicle, incorporating an optical display system, comprising:

(A) a member having a concave semi-reflecting curved surface directed inwardly of the headgear and which when the headgear is being worn is at or is movable to a position at which it intercepts the forward line-of-sight of an eye of the wearer; and

(B) above the level of the wearer's eyes, an optical projector by means of which luminous data is directed at the aforesaid semi-reflecting surface for reflection thereby to the wearer's eye so that the wearer is presented with a virtual image of the aforesaid luminous data within a predetermined field of view centered on the wearer's forward line of sight; characterized in that the concave semi-reflecting surface is spherical; and

(C) the optical projector is secured to the headgear and comprises an extended substantially planar optical data source, and a prism whose shape, dimensions and position are such that rays from all points of the extended planar data source enter the prism at one face thereof, are reflected in the prism downwards to a generally downward and forward facing exit face of the prism, are refracted at



the latter face and are then incident on the spherical semi-reflecting surface; and

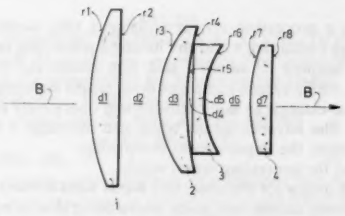
(D) further characterized in that the inclination of the exit face of the prism with respect to the spherical semi-reflecting surface is so chosen that aberration introduced by the prism by virtue of the aforesaid inclination of the exit face is effective to compensate substantially wholly for the aberration introduced by the spherical semi-reflecting surface as a result of the off-axis configuration of the system.

4,081,210

COMPOSITE FOUR-ELEMENT LENS SYSTEM, PARTICULARLY FOR USE WITH LASER BEAMS

Christian Lietar, and Jean-Pierre Blanc, both of Morges, Switzerland, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Feb. 20, 1976, Ser. No. 659,730
Claims priority, application Germany, Feb. 27, 1975, 2508491
Int. Cl.[2] G02B 9/34
U.S. Cl. 350—223 **1 Claim**



1. Composite four-element objective lens having four lens elements (1, 2, 3, 4), each having a forward and backward radius of curvature (r), said lens elements being spaced from each other by predetermined distances (d_{even}), have predeter-

mined thickness (d_{odd}) and are made of materials of predetermined refractive indices (n_d), with material of refractive index 1.000 between said elements;

wherein the relationships of the radii, dimensions, and refractive indices, for a spectral line *d* are set forth in the claim table forming part of this claim, with reference to a focal length of 100 linear units; and wherein *r* is the radius of curvature and n_d the refractive index for the spectral line *d*, of the respective lens element;

Claim Table.

Lens No.	Radius of Curvature (linear units) r	Dimensions (in linear units): odd numbers: lens thickness; even numbers: lens distances d	Refractive Index n_d
1	$r_1 =$ 113.5	$d_1 = 16.25$	$n_1 = 1.69100$
	$r_2 =$ 1004	$d_2 = 21.25$	$n_2 = 1.00000$
2	$r_3 =$ 60.87	$d_3 = 16.25$	$n_3 = 1.69100$
	$r_4 =$ 202.5	$d_4 = 2.35$	$n_4 = 1.00000$
3	$r_5 =$ −4637	$d_5 = 7.5$	$n_5 = 1.69100$
	$r_6 =$ 61.75	$d_6 = 23.75$	$n_6 = 1.00000$
4	$r_7 =$ 77.37	$d_7 = 12.5$	$n_7 = 1.69100$
	$r_8 =$ −3584.		

4,081,211

PROCESSING CONDITION CONTROL SYSTEM FOR A MULTI-PURPOSE FILM HANDLING CARTRIDGE

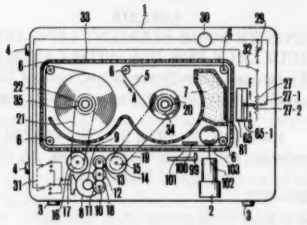
Yoshihiro Shigeta, Tokyo, and Kiyoshi Takahashi, Kunitachi, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 472,442, May 22, 1974, abandoned. This application Aug. 25, 1975, Ser. No. 608,650

Claims priority, application Japan, May 25, 1973, 48-58925; May 25, 1973, 48-58926; May 25, 1973, 48-58927; May 25, 1973, 48-58928

Int. Cl.² G03C *11/00*

U.S. Cl. 352—130 **6 Claims**



1. In a processing system utilizing a film cartridge, said cartridge containing a film and having a processing station and means adapted to advance said film across the processing station, which system comprises drive means including a motor mounted external to said cartridge and operatively connected to said film advance means when said cartridge is loaded in said system, the improvement comprising:

means for generating warm wind;

guide means for directing said warm wind toward said processing station, said guide means being able to be changed over between a first state where a wind path for directing the wind toward said processing station is formed and a second state where said wind path is closed; and

means for controlling the change-over of said guide means and wherein said controlling means comprises:

a thermostatic switch capable of detecting ambient temperature of said processing station; and

a plunger which actuates said guide means under control of said switch, said plunger being electrically connected with said switch and operatively connected with said guide means, said thermostatic switch for controlling said plunger for setting said guide means to the first state when said ambient temperature drops below an optimum processing temperature range.

4,081,212

SYSTEM FOR ELECTROSTATICALLY TRANSFERRING POWDER IMAGES

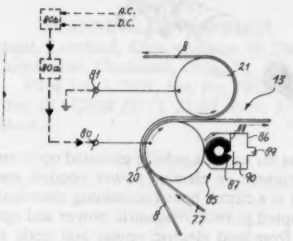
Antonius F. A. M. Wetzer, Eindhoven, Netherlands, assignor to Oce-van der Grinten, N.V., Venlo, Netherlands

Filed Nov. 12, 1975, Ser. No. 631,240

Claims priority, application Netherlands, Nov. 18, 1974, 7414975

Int. Cl.² G03G *15/00*

U.S. Cl. 355—3 TR **11 Claims**



1. In apparatus for electrostatically transferring powder images, comprising an image-carrying support, a rotatable transfer roller, means for transporting said support over said roller with the image supporting side of said support in face to face contact with a part of the circumference of said roller, means for transporting image receiving material between said support and said roller, means for generating an electrical field between said support and the receiving material, and means including at least one cylindrical brush rotatable in contact with said roller for cleaning powder from its surface, the improvement wherein said field generating means comprises means for generating between said support and said transfer roller a pulsating direct current the period time of which is less than the time of contact of any area of said support with the receiving material and less than the time of contact of said at least one cleaning brush with any area of said transfer roller, said support, said transfer roller, said at least one brush and said transporting means being arranged so that said time of contact of any area of said support with the receiving material is longer than said time of contact of said at least one brush with any area of said transfer roller.

4,081,213

FUSER DRIVE SYSTEM

Ari Bar-on, Rochester, and Louis R. Hattler, Marion, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Apr. 29, 1976, Ser. No. 681,361

Int. Cl.² G03G *15/00*

U.S. Cl. 355—3 FU **6 Claims**

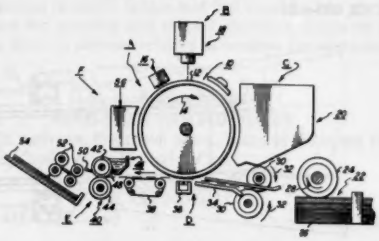
1. A fusing apparatus for substantially permanently affixing particles to a sheet, including:

a fuser roll heated to a first temperature in the operating mode and a second temperature, less than the first temperature, in the standby mode;

a backup roll, operatively associated with said fuser roll, to define a nip through which the sheet having the particles thereon passes;

means for applying release material to said fuser roll;

first drive means coupled to said fuser roll to rotate said fuser roll relative to said backup roll in the standby mode, said first drive means being de-coupled from said fuser roll in the operating mode; and



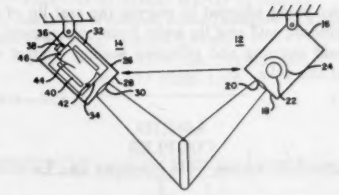
second drive means coupled to said fuser roll in the operating mode to rotate said fuser roll at a greater angular velocity than said first drive means rotates said fuser roll in the standby mode.

4,081,214

LOW ALTITUDE OPTICAL ALTIMETER

Lyman F. Van Buskirk, Ridgecrest, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 6, 1976, Ser. No. 702,541
Int. Cl.[2] G01C *3/08, 3/00*
U.S. Cl. 356—4 **1 Claim**



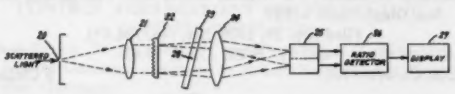
1. An optical altimeter assembly comprising:
an ultraviolet radiation source;
a reflector with an opening, located immediately adjacent to said radiation source so as to receive ultraviolet radiation therefrom and shaped so as to reflect said ultraviolet radiation out of said opening;
a cylindrical lens placed in said opening so as to focus said ultraviolet radiation into a line source of ultraviolet light directed to a distant object for reflection from said distant object so as to provide a reflected line image of said line source;
an objective lens with a focal plane, spaced apart from and in fixed relation to said cylindrical lens for receiving said reflected line image and projecting said reflected line image on said focal plane;
an image intensifier tube configured for image dissection scanning and having an input surface, an cone, focusing cone and deflection coils, with a potential difference between said output surface and said input surface so as to emit a stream of electrons from the area of said input surface receiving said reflected line image with said electron stream passing through said focusing cone,
said input surface lying in said focal plane,
said image tube operative to receive and amplify and transmit said electron stream produced by said reflected line image impinging said input surface;
said focusing cone operative to focus said electron stream to said output surface so as to produce a light output therefrom;
a photodiode array connected to said output surface for detecting the location of said electron stream transmitted as light and so positioned that said transmitted light coincides with said photodiode array when said distant object is a preset altitude from both said cylindrical lens and said image intensifier tube;
means connected to said deflection coils for periodically deflecting said electron stream across said output surfaces when a periodic signal is applied to said deflection means,
said photodiode array operative to generate a peak response output when said received transmitted light coincides with said photodiode array, whereby the instant of said peak response is proportional to the altitude with respect to said preset altitude.

4,081,215

STABLE TWO-CHANNEL, SINGLE-FILTER SPECTROMETER

Carl M. Penney, Clifton Park, and Marshall Lapp, S. Albany, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed May 18, 1976, Ser. No. 687,558
Int. Cl.[2] G01J *5/48, 3/44*
U.S. Cl. 356—45 **17 Claims**



1. A spectrometer for making simultaneous measurements of light intensity in two spectral channels, comprising:
an interference filter;
means for splitting monitored light into two simultaneous collimated beams, each beam being directed in a separate direction, respectively, toward said filter such that the incident angle of each beam upon said filter coincides with the incident angle required for passage through said filter of a separate wavelength band, respectively, to be observed;
optical detecting means responsive to each separate beam, respectively, emerging from said filter; and
means responsive to said detecting means for producing an indication of the intensities of the beams emanating from said filter.

4,081,216

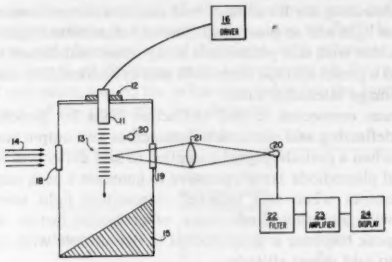
ULTRASONIC TRANSDUCER CALIBRATION

Bill D. Cook, Houston, Tex., assignor to The United States of America as represented by the Department of Health, Education and Welfare, Washington, D.C.

Filed Jun. 25, 1976, Ser. No. 699,996
Int. Cl.[2] G02F *1/11*
U.S. Cl. 356—256 **11 Claims**

1. An acousto-optical method of measuring the radiation produced by a transducer in the range of about 500 KHz to 10 MHz and calibrating the same consisting of:
(a) propagating ultrasound frequencies through a transparent liquid medium in a cell;
(b) passing incident light through said cell at a right angle to the direction of said ultrasound and intersecting said ultra-

sound and modulating the phase of said light with the frequency of said ultrasound to produce modulated light;



(c) detecting said modulated light by a fast photodetector placed in close proximity of the sound field to produce a signal representative of said radiation; and,

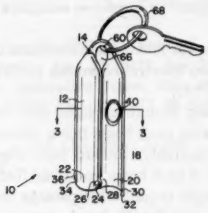
(d) filtering, amplifying and measuring said signal.

4,081,217

FOLDABLE PEN

Michael C. Klaber, c/o William Klaber 6560 Montazuma Dr., San Diego, Calif. 92115

Filed Sep. 27, 1976, Ser. No. 726,471
Int. Cl.[2] B43K *23/02, 29/00*
U.S. Cl. 401—131 **5 Claims**



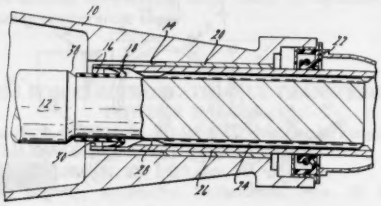
1. A foldable pen or like writing instrument comprising a first elongated member having a writing nib extending from a first end thereof, a second elongated member pivotally connected at a first end thereof to a second end of said first elongated member and capable of being rotated from an opened writing position wherein said elongated members are disposed substantially coaxially with one another to a closed position wherein said members are disposed parallel and alongside each other, means for releasably locking said pen in said opened position, means for releasably locking said pen in said closed position, loop forming means affixed to a second end of said second elongated member and having means for connecting to said nib to form a continuous loop when said pen is in the closed position, wherein said elongated members are pivotally connected at first corresponding peripheral edges thereof and wherein said means for releasably locking said pen in the opened position includes a resilient detenting prong disposed at a second peripheral edge of said second elongated member and projecting therefrom, said second edge disposed opposite said first edge, and means defining an aperture formed near a second peripheral edge of said first member, said edge corresponding to said second edge of said second member and said aperture receptive of said detenting prong when the pen is rotated into the fully opened position thereby retaining the pen in the opened position.

4,081,218

TRANSMISSION EXTENSION OIL SEAL

Martin G. Gabriel, Birmingham, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Mar. 21, 1977, Ser. No. 779,875
Int. Cl.[2] F16d *1/00*
U.S. Cl. 403—24 **6 Claims**



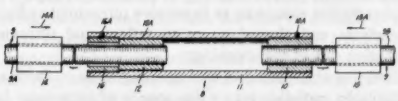
1. A combined shipping seal and drive shaft yoke seal assembly for a transmission having a main housing and an extension housing, an output shaft located in the extension housing, a seal surrounding the output shaft, the output shaft extending through a circular opening in the extension housing, said seal being arranged in sealing engagement with the surface of the shaft and having at least one circular seal lip thereon, the margin of said seal lip engaging the inner surface of said opening in the extension housing whereby fluid within the main transmission housing is sealed within the main housing thus preventing leakage of fluid through the extension housing opening, said output shaft having an external spline portion, a slip yoke forming a part of the universal joint and having an internally splined opening, the slip yoke being adapted to be inserted within the opening with its spline teeth and registering with the external splines of the output shaft, the innermost end of the yoke being adapted to engage the seal lip of said seal thereby pushing said seal lip away from engagement with the wall of said opening and effecting sealing contact with the interior of the yoke.

4,081,219

COUPLER

Maximiliaan J. Dykmans, 4434 Mayopan Dr., La Mesa, Calif. 92041

Filed Oct. 12, 1976, Ser. No. 731,514
Int. Cl.[2] F16B *7/06*
U.S. Cl. 403—43 **1 Claim**



1. A coupling mechanism for securing a preadjusted tension in a cable having a first cable end and a second cable end, the combination including an elongated coupling body having a first end portion and a second end portion within which said first and said second cable ends respectively extend, a first abutment means on said first of said cable ends, said first abutment means and said first end portion of said coupling body being spaced such that said first abutment means may freely move axially within said coupling body, means defining a screw threaded connection between said second cable end and said second coupling portion such that turning of said coupling body about its axis results in axial movement of said coupling body on said second cable end, a second abutment means on said first coupling end portion for engagement with said first abutment means on said first cable end, said first abutment means being spaced between said screw threaded connection and said second abutment means, said first and said second abutment means being moved into engagement by turning said coupling body about its axis to turn said coupling body on said

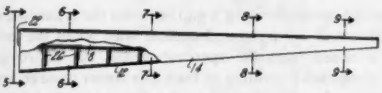
second cable end and to move said second abutment on said first coupling portion towards said first abutment means during which said first abutment means is free to move in said coupling body, said first abutment including an element threaded on said first cable end, and said second abutment means including an element threaded within said first coupling end portion, and means for securing said second abutment means on said coupling body to prevent relative movement therebetween.

4,081,220

SEMI-SPAR WOUND BLADE

Merritt B. Andrews, Westfield, Mass., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 17, 1976, Ser. No. 751,578
Int. Cl.² F03D 1/06
U.S. Cl. 416—226 **10 Claims**



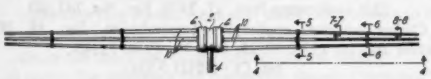
1. A wind turbine blade tapering from base to tip including a filament wound spar having an airfoil-shaped portion at and near the tip and forming the finished shape of the blade, said portion tapering toward the tip and the remaining portion of the spar having a filament wound tapering trailing edge portion mounted thereon with the filaments on the trailing edge portion extending around the spar.

4,081,221

TRIPOD BLADED WIND TURBINE

Merritt B. Andrews, Westfield, Mass., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 17, 1976, Ser. No. 751,580
Int. Cl.² F03D 1/06
U.S. Cl. 416—227 A **12 Claims**



1. A blade for a wind turbine comprising:

a base for mounting for turning on a hub on an axis radial to the hub,

at least three elongated airfoil shaped vanes connected at their inner ends to said base in spaced relation to one another and to the turning axis of the base, and with one of the vanes offset from the others in a direction parallel to the vane chords, said vanes converging toward the tips, and

shroud means connecting the vanes together with the vane chords parallel in closely spaced relation near the outer end to produce a tripod effect for the blade.

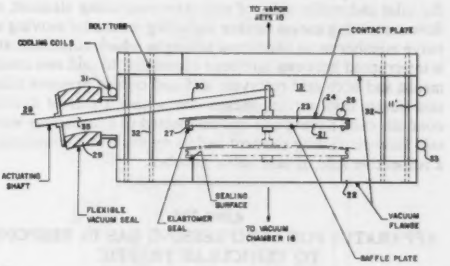
4,081,222

COMBINED VACUUM BAFFLE AND VALVE FOR DIFFUSION PUMP

Ronald D. Smith, Bovingdon, England; Steven B. Frankel, San Jose, Calif.; John R. Reeher, and Michael S. Story, both of Los Gatos, Calif., assignors to Finnigan Corporation, Sunnyvale, Calif.

Filed Mar. 4, 1976, Ser. No. 664,002
Int. Cl.² F04F 9/00
U.S. Cl. 417—153 **2 Claims**

1. A vacuum system having a pumped chamber and means for connecting said pumped chamber to a vacuum chamber said system comprising: dual function means located in said pumped chamber for both closing said connection in one position and serving as an optical backstream baffle in another position to prevent backstreaming such dual function means also being spaced a sufficient distance from the walls of the pumped chamber and said connection to provide a relatively high conductance between said pumped chamber and vacuum



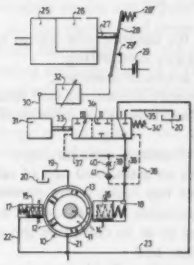
chamber; and means for cooling said dual function means in said baffle position, and where said dual function means includes a plate of high thermal conductivity and a flexible contact plate mounted on said high conductivity plate and where said cooling means is a fixed coil against which said contact plate is deformed in said baffle position.

4,081,223

CONTROL ARRANGEMENT FOR PREVENTING SYSTEM OVERLOAD

Hans-Jürgen Fricke, Stuttgart, and Paul Bosch, Ludwigsburg, both of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Jun. 25, 1976, Ser. No. 699,860
Claims priority, application Germany, Jul. 15, 1975, 2531492
Int. Cl.² F04B 49/00
U.S. Cl. 417—218 **6 Claims**



1. In a combination with pump means and a prime mover driving the pump means, a control arrangement for preventing prime mover overload, the control arrangement comprising hydraulically-operating adjusting means operative for adjusting the volume of fluid discharged by said pump means said adjusting means including a pair of hydraulic units, each having a piston mounted for movement in a respective bore; a pair of conduit means, each having one end connected to a respective one of said bores and another end connected to the output pressure side of said pump; multi-setting valve means connected to said adjusting means and operative for controlling the operation thereof in dependence upon the setting of said valve means, said multi-setting valve means including a reservoir and a valve member movable between one setting in which said bore connected to one of said conduit means is in hydraulic communication with said output pressure side of said pump, and another setting in which said bore connected to said one conduit means is in communication with said reservoir;

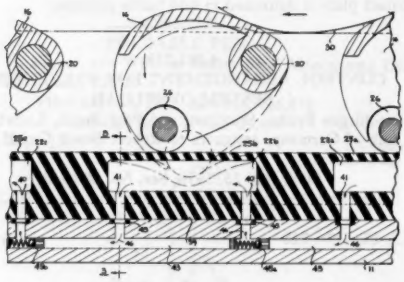
means operative for generating an overload signal when the loading of said prime mover has reached a predetermined value; means operative in response to said overload signal for counteracting prime mover overload by causing said valve means to activate said adjusting means; and flow-restricting means including a flow-restricting element in said one conduit means and operative for generating a pressure differential at the inlet and outlet sides of said flow-restricting element, said flow-restricting means further including means for moving said valve member to an additional setting in which communication is interrupted between said bore connected to said one conduit means and both said reservoir and said output pressure side of said pump, said moving means comprising a pair of auxiliary conduits each having one end connected to a respective side of said flow-restricting element and its opposite end connected to a respective side of said valve member.

4,081,224

APPARATUS FOR COMPRESSING GAS IN RESPONSE TO VEHICULAR TRAFFIC

Walter H. Krupp, 9350 Bolsa Ave., #61, Westminster, Calif. 92683

Filed Nov. 18, 1976, Ser. No. 742,984
Int. Cl.[2] F04B *35/00, 45/04*
U.S. Cl. 417—229 **12 Claims**



1. Apparatus for compressing gas in response to vehicular traffic on a roadway comprising:

a plurality of actuator members,

means for movably supporting said actuator members on the surface of the roadway for individual random actuation by said traffic,

a plurality of chambers each having at least one resilient top wall beneath an associated one of said actuator members, said resilient top walls being pressed inwardly by their associated actuator members when said actuator members are actuated so as to compress the gas within the associated chamber, and

means for providing fluid interconnections between said chambers whereby the chambers are connected together with each other to form a series chain of chambers, the contact areas between the actuator members and chambers and the volume of the chambers being successively smaller for each succeeding chamber in said series chain, the gas in succeeding chambers in the series chain being brought to successively higher compression levels.

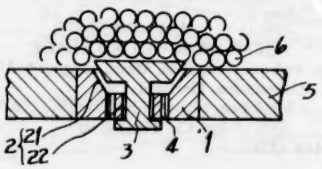
4,081,225

STEAM APERTURE DEVICE

Masato Yaita, Souwa, Japan, assignor to Sekisui Kaseihin Kogyo Kabushiki Kaisha, Japan

Filed Sep. 27, 1976, Ser. No. 726,750
Claims priority, application Japan, Sep. 30, 1975, 50-118611; Oct. 17, 1975, 50-142151; Dec. 12, 1975, 50-168180
Int. Cl.[2] B29D *27/00*
U.S. Cl. 425—4 R **9 Claims**

1. In a mold for preparing a foamed article of thermoplastic resin, said mold comprising an aperture means provided with an aperture extending through a cavity plate of the mold and a moving means inserted in said aperture, the aperture having a truncated conical wall progressively enlarged towards the end on one side and a cylindrical wall on the other side, said conical wall and said cylindrical wall having a common axis, said moving means having a cylindrical surface and a truncated conical surface corresponding to said truncated conical wall,



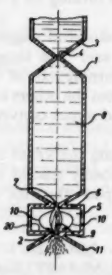
said moving means forming a gap between the truncated conical surface and the truncated conical wall when the moving means is raised from the aperture means, the improvement which comprises providing at least one steam passage around the cylindrical wall in the aperture means, one end of the steam passage being open at the small circular end of truncated conical portion of the aperture means, and the other end of the steam passage being open at the back side of the cavity plate.

4,081,226

PROCESS FOR THE MANUFACTURE OF SHORT FIBRILS AND DEVICES FOR CARRYING IT OUT

Jean-Pierre Pleska, Paturages, and Michel Maréchal, Brussels, both of Belgium, assignors to Solvay & Cie., Brussels, Belgium

Division of Ser. No. 541,622, Jan. 16, 1975, Pat. No. 4,010,229.
This application Nov. 17, 1976, Ser. No. 742,685
Claims priority, application Luxembourg, Jan. 18, 1974, 69196; Jul. 12, 1974, 70525; Oct. 18, 1974, 71145
Int. Cl.[2] D01D *5/00*
U.S. Cl. 425—6 **14 Claims**



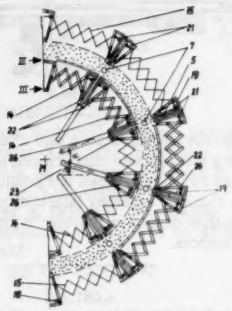
1. In a device for the manufacture of fibrils of short length by suddenly releasing the pressure acting on a liquid mixture of molten polymer and solvent comprising a spinneret containing a chamber having at least one supply orifice for supplying the liquid mixture to said chamber and one pressure release orifice opposite the supply orifice for ejecting the liquid mixture from said chamber to a lower pressure region, the improvement wherein the distance between said supply orifice and said pressure release orifice is less than three times the transverse dimension of said chamber so that said chamber acts as a perturbation chamber.

4,081,227

SLIP FORM

Walter Bohmer, Everskamp 31, 4035 Brietscheid, and Stefan Falticko, Eifelstrasse 25, 565 Soligen, both of Germany

Continuation-in-part of Ser. No. 502,847, Sep. 3, 1974, abandoned. This application Apr. 19, 1976, Ser. No. 678,214
Claims priority, application Germany, Sep. 3, 1973, 2344402
Int. Cl.[2] E04B *1/16, 1/04*
U.S. Cl. 425—65 20 Claims



1. A slip form for molding a wall of a structure, wherein the slip form comprises:

(a) means for supporting said slip form, wherein said slip form supporting means projects upwardly from finished portions of the wall;

(b) means for lifting said slip form, wherein said lifting means are mounted on said slip form supporting means;

(c) connecting means mounted on said slip form supporting means and spaced from the finished portions of the wall;

(d) inner carrying frames and outer carrying frames;

(e) means for suspending said inner carrying frames and outer carrying frames from said connecting means so that said frames extend from the connecting means to and along the inner and outer surfaces of the wall;

(f) means for adjusting the transverse distance between the inner carrying frames and outer carrying frames, said means disposed adjacent said connector means, above said frames, and between said suspending means to allow the carrying frames to adjust for walls of different thickness;

(g) inner and outer form plates for engaging said wall and molding material into finished portions of said wall, said plates being adjustable along the periphery of said wall;

(h) lateral frame members pivoted to the inner and outer carrying frames about horizontal axes, which are substantially parallel to the extent of the wall, said lateral frame members engaging said form plates to hold said form plates in engagement with said wall;

(i) platform mounts pivotally attached to said carrying frames for mounting platforms upon which workers and material are supported;

(j) inner and outer spacing means extending between adjacent inner carrying frames and adjacent outer carrying frames for determining the spacing between adjacent frames and for rendering that spacing adjustable, said spacing means extending in a first plane adjacent the finished portion of the wall; and

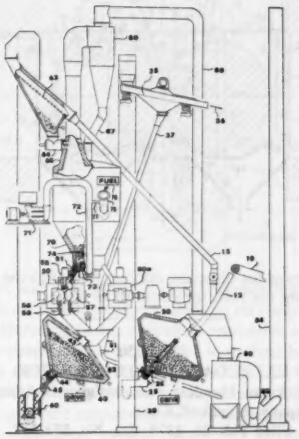
(k) wherein each inner carrying frame and each outer carrying frame form transversely aligned carrying frame pairs, and wherein upper adjustable spacing means extend between adjacent carrying frame pairs, said upper spacing means extending in a plane spaced upwardly from said first plane and adjacent said connecting means.

4,081,228

APPARATUS FOR HOT BRIQUETTING

James E. Moore, 1401 Meadow La., Glenview, Ill. 60025

Filed Apr. 21, 1977, Ser. No. 789,629
Int. Cl.[2] F27B *7/00*
U.S. Cl. 425—144 10 Claims



1. A system for heating and hot briquetting feed material consisting of particulate materials ranging in size up to ¾ inch and in specific gravity up to 5 containing heat-softenable matter and from zero to 100 percent of the fuel needed for heating the material comprising, in combination, a furnace in the form of a fluid bed reactor having an input and an output, a roll-type compactor having an input and an output, means for supplying feed, air and supplementary fuel to the bed, means including a flue at the top of the furnace for conducting away the furnace off gas, a feed conduit connected to the furnace output and the compactor input including means for regulating the feed rate from the furnace to the compactor, and means for discharging the hot briquettes from the compactor, the fluid bed reactor having a heat generating capacity rate of 700,000 to 2,800,000 BTU per square foot of internal horizontal cross section area at its bottom so as to be capable of processing feed material over a reasonably wide range of throughput and having substantial variations in particle size, density, temperature and fuel content.

4,081,229

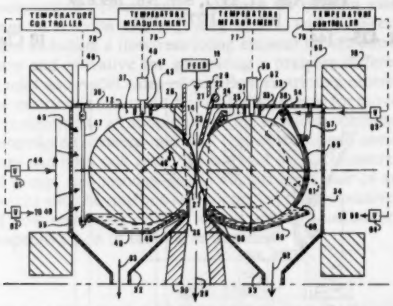
COMPACTOR FOR HOT BRIQUETTING

James E. Moore, 1401 Meadow La., Glenview, Ill. 60025

Filed Apr. 21, 1977, Ser. No. 789,633
Int. Cl.[2] B29C *3/02, 3/04, 3/06, 15/00*
U.S. Cl. 425—144 16 Claims

1. A briquetting machine for hot briquetting feed material containing heat-softenable matter comprising, in combination, a frame, a pair of opposed briquetting rolls having shafts and bearing blocks supported by the frame, high temperature feeding, compacting and discharge zones defined by inlet and outlet nips between the rolls, a high temperature enclosure surrounding only the high temperature feeding, compacting

and discharge zones, cooling enclosures surrounding portions of the respective rolls external to the high temperature enclosure, and means for directing cooling fluid into the enclosures for contacting the rolls for cooling the same.

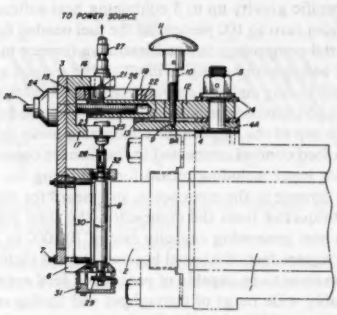


4,081,230

EXTRUDATE CUTTING DEVICE

Leslie N. Glickman, Flanders, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed Feb. 26, 1975, Ser. No. 553,367
Int. Cl.[2] B29F *3/00*
U.S. Cl. 425—192 R **5 Claims**



1. An extrudate cutting device comprising:
an extruder fitted with an extrusion die plate having orifices therein,
frame means,
fastening means at one end of said frame means for attaching said frame means to said extruder,
adaptor means at the other end of said frame means receiving a rotatable elongated cutting means means,
said elongated cutting means comprising at least one cylindrical roller rotatably mounted in said frame means such that the axis of said roller is located in the direct path of extrudates leaving said orifices of said extrusion die plate of said extruder.

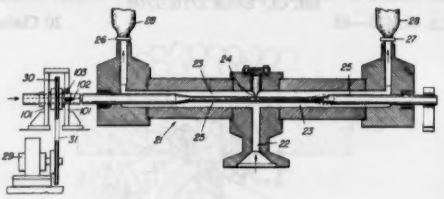
4,081,231

FLOW DISTRIBUTION VALVE FOR DUAL THERMOPLASTIC TUBE EXTRUSION

F. John Herrington, Holcomb, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 23, 1976, Ser. No. 753,747
Int. Cl.[2] B29F *3/06*
U.S. Cl. 425—464 **1 Claim**

1. An apparatus for controlling the flow of molten polymer streams, comprising at least two die outlet orifices to which each of said molten polymer streams are fed from a common source and at least two inlet orifices, having constant cross-sectional areas, in communication with said die orifices, said common source comprising a flow channel having a substantially centrally located inlet opening, said flow channel containing a flow restriction means, said restriction means comprising a rod



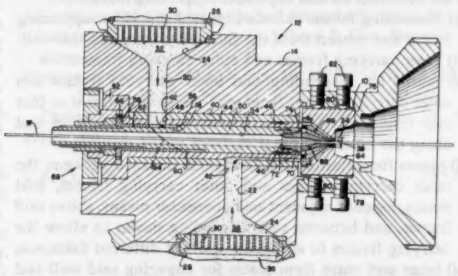
which is laterally displaceable in said channel, the ends of said rod extending through said inlet orifices, said rod being further characterized by having at least one portion of its cross-section enlarged in diameter whereby lateral displacement of said rod controls the flow of molten polymer through said inlet orifices to said die orifices.

4,081,232

FIXED CENTER TOOLING FOR AN EXTRUDER THAT PROVIDES FOR CONCENTRIC LAYERS OF COATING MATERIAL

Denver L. Pemberton, Fairmount, and Elmer E. Smith, Muncie, both of Ind., assignors to The Anaconda Company, New York, N.Y.

Filed Feb. 8, 1977, Ser. No. 766,781
Int. Cl.[2] B29F *3/04*
U.S. Cl. 425—463 **2 Claims**



1. A fixed center extruder die assembly for applying concentric layers of coating material over an advancing core wire embodies an outer die block means with a first passage therethrough having a first longitudinal axis and including a first internal engaging portion; said die block means also including a generally annular guiding shoulder formed with an inwardly directed first abutment surface, an intermediate passage portion being concentric to the first axis and terminating in a first plane transverse to the first axis, and a generally smooth decreasingly tapered surface extending from the abutment surface to the intermediate passage; guiding die means having a second passage therethrough having its axis substantially coincident with the first axis, first flange means securely cooperating with the first internal engaging portion and having an aligning portion cooperating with the first abutment, a multiplicity of spaced ports formed in the flange for permitting flow of a first coating material therethrough, and a cylindrical tubing tip concentrically disposed within the intermediate passage for forming a first annular and concentric material passageway and terminating in the first plane, the guiding die means also including a generally thin walled conical section interconnecting the tip and the first flange, a second internal engaging

section formed internally of the first flange, and a second generally annular guiding shoulder formed with an inwardly directed second abutment surface; and inner guiding means defining a third passageway extending therethrough with its axis substantially coincident to the first axis and including a third flange having an external surface securely engaging the second internal engaging section, a mulitiplicity of spaced ports, a second aligning portion cooperating with the second abutment shoulder, a second cylindrical tubing tip concentrically disposed within the first tip and terminating in the first plane for forming a second annular and concentric material passageway.

4,081,233
COMBUSTION DEVICE

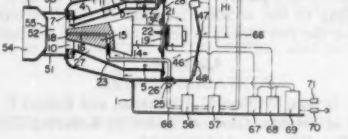
Soichi Kitajima, Nara; Toshiyuki Ishiguro, Yamatokoriyama; Tadao Kanno, Kyoto; Katsuhiko Yamamoto, Nabari, and Makoto Hori, Ikoma, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 8, 1975, Ser. No. 638,604

Claims priority, application Japan, Jun. 19, 1975, 50-75131; Jun. 19, 1975, 50-75132

Int. Cl.² F23C *3/02*

U.S. Cl. 431—1 **22 Claims**



1. A combustion device of the type for atomizing liquid fuel by an ultrasonic atomizer and mixing the atomized fuel particles with the air for combustion, comprising

(a) an ultrasonic atomizer supported by a supporting system and including an atomizing surface at which liquid fuel is atomized;

(b) a liquid fuel supply system adapted to supply liquid fuel to said atomizing surface;

(c) a primary air passage formed around substantially said entire ultrasonic atomizer and opened at said atomizing surface;

(d) a secondary air passage in the form of a cylinder formed around substantially said entire primary air passage and opened at the vicinity of said atomizing surface and divided therefrom by a partition wall;

(e) an air supply system for supplying the air into said primary and secondary air passages and for forcing the air in both said air passages to flow toward the vicinity of said atomizing surface through said passages;

(f) swirling means located in the vicinity of said atomizing surface and attached to an end of said partition wall means; and adapted to swirl the air flowing from said secondary air passage in a direction tangential to the air flowing in said primary air passage, said swirling means comprising first swirling means for swirling the air in the direction tangential to said secondary passage, and second swirling means located at the discharge end of said secondary air passage for directing the swirling air to said atomizing surface; and

(g) a combustion section in which the air flowing out of said primary and secondary air passages and the atomized fuel particles are mixed, ignited and burned.

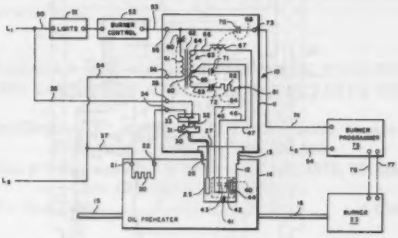
4,081,234
LIMIT AND CONTROL FOR HEAVY OIL PREHEATING

Dale A. Mueller, St. Paul, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jan. 5, 1977, Ser. No. 757,110

Int. Cl.² F23H *5/00*

U.S. Cl. 431—28 **8 Claims**



1. A limit and control for heavy oil preheating adapted for use with an oil burner system, including: oil temperature sensing means including first temperature responsive switch means adapted to operate an oil heater used to preheat heavy fuel oil to maintain a sufficiently low viscosity to properly utilize the fuel oil; said oil temperature sensing means further having second temperature responsive switch means including a single-pole, double-throw switch; transformer means including a primary winding adapted to be connected to a source of power, and a tapped, secondary winding; said tapped secondary winding connected to a first circuit including a relay, a portion of said second switch means which is closed when said fuel oil is at or above a predetermined temperature, a safety switch heater, and a normally closed relay contact; said safety switch heater being coupled to safety switch contact means to open circuit said transformer means upon said safety switch heater being energized for a predetermined period of time; said tapped secondary winding further connected to complete latching circuit means including a normally open relay contact, said safety switch heater, and said normally closed relay contact to provide a latching action for said relay upon said relay being energized through said safety switch heater; said normally open relay contact being connected in parallel circuit with a portion of said second switch means that is open circuited upon said fuel oil being at or above said predetermined temperature; and a further normally open relay contact which closes upon operation of said relay and is adapted to connect said source of power to said oil burner system to cause said system to be operative.

4,081,235
VALVE INTERLOCK

Rutgerus Antonius van der Veer, Tujunga, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

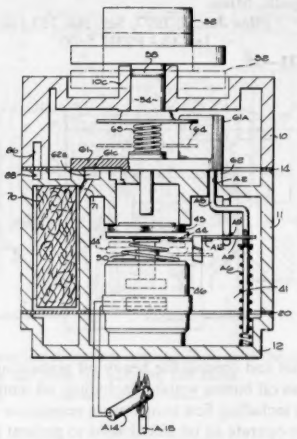
Filed Jun. 23, 1976, Ser. No. 698,864

Int. Cl.² F23N *5/10;* **F16K** *35/14*

U.S. Cl. 431—54 **4 Claims**

1. A system for controlling a combustible fluid, said system comprising: a valve body; a manual valve having a rotatable part with a flat surface; a safety valve in communication with said manual valve; a main burner; a pilot burner positioned adjacent said main burner; thermally responsive means including a thermocouple positioned adjacent said pilot burner; an electromagnet connected from said thermally responsive means to hold said safety valve open when said pilot burner is lit; a pin guided to slide axially and perpendicularly with respect to said flat surface of said rotatable part, said manual valve having a hole in said flat surface; and means to urge said

pin to enter said hole when said safety valve is opened, said pin entering said hole and locking said part in a position fixed



relative to said valve body when said manual valve is moved to its closed position.

4,081,236

KILNS

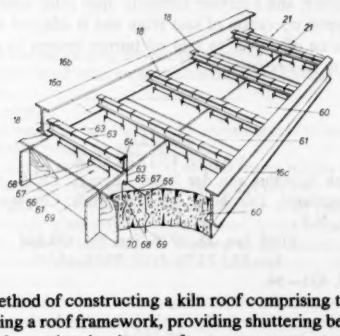
James Trail Sinclair Corbett, Duffield, England, assignor to Butterley Building Materials Limited, Great Britain

Filed May 14, 1976, Ser. No. 686,477

Claims priority, application United Kingdom, May 23, 1975, 22948/75

Int. Cl.[2] F27D *1/16, 1/08*

U.S. Cl. 432—3 **4 Claims**



1. A method of constructing a kiln roof comprising the steps of providing a roof framework, providing shuttering below the framework, casting in situ a refractory concrete to form a concrete layer below the framework, hanging suspension devices from the framework and embedding anchors of the suspension devices in the concrete layer before setting of the latter, providing crack inducing members in the concrete layer before setting of the latter, allowing the concrete to set, removing the shuttering, and firing the kiln so that the crack inducing members form a plurality of sealed thermal expansion cracks that divide the layer into a plurality of panels.

4,081,237

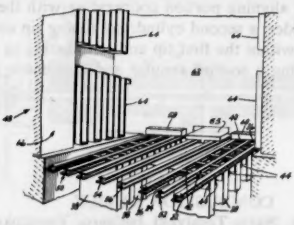
HEARTH CONSTRUCTION AND METHOD OF MANUFACTURE

Dennis L. Wright, 9911 Jamaica Dr., Fort Wayne, Ind. 46825

Filed Apr. 29, 1976, Ser. No. 681,460

Int. Cl.[2] F27D *1/16*

U.S. Cl. 432—3 **6 Claims**



1. A hearth construction for use on and support by upstanding subfloor pier blocks comprising a first plurality of parallel, elongated transversely spaced apart beams; a second plurality of parallel transverse beams spaced longitudinally of and affixed to said first plurality of beams for adding structural support to said longitudinal beams to provide a predetermined transversely spaced relation;

said pier blocks being below said beams;

a plurality of pier plate pairs mounted transversely to said first plurality of beams and longitudinally spaced thereof in correspondence to pier block position; said plates in each pair being parallel and spaced apart a distance corresponding to the width dimension of the pier blocks to receive the pier blocks in beam supporting relation.

4,081,238

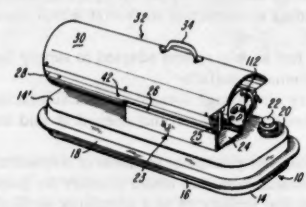
PORTABLE HEATER

Eugene C. Briggs; William C. Wellbaum, and Robert F. Shaftner, all of Dayton, Ohio, assignors to Koehring Company, Milwaukee, Wis.

Filed Aug. 8, 1975, Ser. No. 603,038

Int. Cl.[2] F24H *3/04;* B01D *33/34*

U.S. Cl. 432—222 **25 Claims**



1. A portable space heater comprising a fuel tank mounting means defining a combustion chamber having at one end thereof means defining an inlet thereto and at the opposite end thereof means defining an outlet therefrom, a strap-like structure connected with said means defining said combustion chamber to bridge the inlet thereto, said strap-like structure having the discharge end of a fuel nozzle in connection therewith and projected therefrom to said inlet, vane means in connection with said strap-like structure adjacent said inlet, additional vane means in connection with the means defining said inlet, means for directing fuel from said tank to move to and through said nozzle, means for ignition of the fuel on discharge thereof from said nozzle and means for delivering a flow of air to move to and about said nozzle under the composite influence of said vane means on said strap-like structure and said vane means in connection with the means defining said inlet whereby to produce a swirling flow of air the form of which insures an essentially complete burning of the fuel discharged from said nozzle.

4,081,239

STORAGE STABLE CONCENTRATED AQUEOUS SOLUTIONS OF AMINOMETHYLATED PHTHALOCYANINES

Patrick Joseph Jefferies, Fort Mitchell, Ky., assignor to Sterling Drug Inc., New York, N.Y.

Filed Aug. 6, 1976, Ser. No. 712,175
Int. Cl.[2] C09B 47/04
U.S. Cl. 8—1 XA 8 Claims

1. A storage-stable dye composition comprising a concentrated, free-flowing, aqueous solution containing by weight of the entire composition:

(a) as the dye constituent approximately 10 to approximately 40 percent of a dissolved methanesulfonic acid addition salt or a mixed methanesulfonic acid-hydrochloric acid addition salt of a metal phthalocyanine selected from the group consisting of copper phthalocyanine, zinc phthalocyanine and cobalt phthalocyanine, said metal phthalocyanine having at least two and not more than six aminomethyl substituents, from zero to two phthalimidomethyl substituents, zero to one sulfonic acid substituent, zero to two complexed hydrochloric acid molecules and two to six complexed methanesulfonic acid molecules;

(b) approximately 5 to approximately 20 percent of a glycol selected from the group consisting of ethylene glycol, propylene glycol, diethylene glycol and diethylene glycol monoethyl ether; and

(c) approximately 85 to approximately 40 percent of water.

6. A methanesulfonic acid addition salt or a mixed methanesulfonic acid-hydrochloric acid addition salt of a metal phthalocyanine selected from the group consisting of copper phthalocyanine, zinc phthalocyanine and cobalt phthalocyanine, said metal phthalocyanine having at least two and not more than six aminomethyl substituents, from zero to two phthalimidomethyl substituents, zero to one sulfonic acid substituent, zero to two complexed hydrochloric acid molecules and two to six complexed methanesulfonic acid molecules.

4,081,240

PROCESS FOR DYEING FULLY SYNTHETIC TEXTILE MATERIAL

Keshav Vinayak Datye; Purushottam J. Kangle, both of Goregaon-Bombay, India; Branimir Milicevic, Riehen, Switzerland; Alfred Litzler, Itingen, Switzerland, and Eugen Johann Koller, Oberwil, Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

Continuation of Ser. No. 421,890, Dec. 5, 1973, abandoned, which is a continuation of Ser. No. 221,077, Jan. 26, 1972, abandoned, which is a continuation of Ser. No. 109,956, Jan. 26, 1971, abandoned, which is a continuation-in-part of Ser. No. 762,145, Sep. 24, 1968, abandoned. This application Jun. 16, 1975, Ser. No. 587,491
Int. Cl.[2] D06P 3/54
U.S. Cl. 8—94 A 7 Claims

1. A process for dyeing textile material of fully stretched linear polyester fibers by the exhaustion method, comprising the step of immersing textile material for at least about 15 minutes, at a temperature of at least 70° C in a non-aqueous homogeneous solution of a disperse dyestuff in a chlorinated aliphatic hydrocarbon solvent material having a boiling point of at least 100° C.

4,081,241

DIAGNOSTIC PROCESS

Franz Porzsolt, Hachborn; Christoph Tautz, Tubingen; Rudolf Schmidtberger, Marburg an der Lahn; Wolfgang Ax, Wehrda, and Burkhard Enders, Marburg an der Lahn, all of Germany, assignors to Behringwerke Aktiengesellschaft, Marburg an der Lahn, Germany

Filed Aug. 28, 1975, Ser. No. 608,704
Claims priority, application Germany, Aug. 30, 1974, 2441536
Int. Cl.[2] G01N 27/26, 33/16
U.S. Cl. 23—230 B 4 Claims

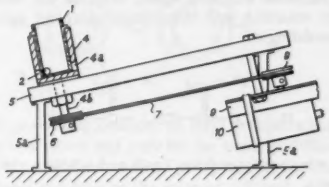
1. In an in vitro diagnostic method wherein lymphocytes are incubated with antigens, the incubation mixture or the cell-free supernatant thereof is added to a dispersion of macrophages, and the migration speed of the macrophages is measured in an electric field, the improvement wherein said incubation mixture or cell-free supernatant is added to a dispersion of particles other than macrophages, said particles being interactive with said incubation mixture or supernatant whereby their behavior in the electric field is modified in a detectable manner, and said particles further showing a substantially uniform behavior in the electric field.

4,081,242

APPARATUS AND METHOD FOR MEASURING THE TIME TAKEN FOR A CHANGE IN VISCOSITY TO OCCUR

Antoine Girolami, 57, rue du Coq, 13001 Marseille, France

Filed Jul. 12, 1976, Ser. No. 704,650
Claims priority, application France, Jul. 16, 1975, 75 22641
Int. Cl.[2] G01N 33/16, 11/10
U.S. Cl. 23—230 R 6 Claims



6. A method, of detecting a change of viscosity in a medium, which comprises the steps of:

(i) placing a quantity of medium in a receptacle having a planar base and a bounding wall upstanding from said base

(ii) placing a ball in said medium in said receptacle

(iii) rotating said receptacle, containing said medium and said ball, about an axis normal to the plane of said base, said axis being at an inclination to the horizontal, and

(iv) detecting any change occurring, in either direction, between a first state of viscosity of the medium in which the ball remains substantially in the same position as it is supported by and rolls along said base and bounding wall, and a second state of viscosity of the medium in which the ball is carried by the medium about the axis of rotation of the receptacle.

4,081,243

Patent Not Issued For This Number

4,081,244

IMMUNOASSAY PROCEDURE EMPLOYING NOVEL IMMUNOCHEMICAL COMPOSITES

Alan J. Polito, Costa Mesa, and William S. Knight, Laguna Beach, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed May 3, 1976, Ser. No. 682,807
Int. Cl.[2] G01N 31/06, 33/16
U.S. Cl. 23—230.6 13 Claims

1. A method of separating free from bound fractions in an immunoassay procedure of the type wherein a solution is contacted with a composite comprising a finely divided, activated, polysaccharide matrix covalently coupled to a primary antibody, wherein the improvement comprises contacting said solution with a composite comprising a finely divided, derivatized, polysaccharide matrix covalently coupled to an antibody selected from a group consisting of primary and secondary antibodies via a bifunctional coupling agent having a formula

$$H_{2e+1}C_eO-\overset{+NH_2}{\overset{\|}{C}}-(CH_2)_n-\overset{+NH_2}{\overset{\|}{C}}-OC_eH_{2e+1}$$

wherein *n* is an integer from 1 to 6 and wherein *e* is an integer from 1 to 2; and wherein said finely divided, derivatized, polysaccharide matrix comprises a finely divided, activated, polysaccharide matrix having an average wet maximum dimension of 1 to 18 microns, coupled to an α,ω-diaminospacer via one of said α,ω-diamonospacer's amino groups.

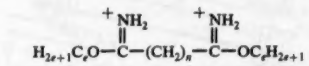
4,081,245

IMMUNOASSAY PROCEDURE EMPLOYING NOVEL IMMUNOCHEMICAL COMPOSITES

Alan J. Polito, Costa Mesa, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed May 3, 1976, Ser. No. 682,808
Int. Cl.[2] G01N *31/06, 33/16*
U.S. Cl. 23—230.6 **10 Claims**

1. A method of separating free from bound fractions in an immunoassay procedure of the type wherein a solution is contacted with a immunochemical composite comprising a derivatized polysaccharide matrix covalently coupled to an antibody by a bifunctional coupling agent, wherein the improvement comprises selecting said bifunctional coupling agent from a group consisting of



wherein *n* is an integer from 1 to 6 and wherein *e* is an integer from 1 to 2.

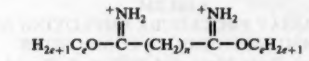
4,081,246

SOLID PHASE COLUMN IMMUNOASSAY PROCEDURE EMPLOYING NOVEL IMMUNOCHEMICAL COMPOSITES

Alan J. Polito, Costa Mesa, and William S. Knight, Laguna Beach, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed May 3, 1976, Ser. No. 682,830
Int. Cl.[2] G01N *31/06, 33/16*
U.S. Cl. 23—230.6 **17 Claims**

1. A method of separating free from bound fractions in a solid phase column immunoassay procedure of the type wherein a solution is contacted with a composite comprising an activated polysaccharide matrix covalently coupled to a primary antibody, wherein the improvement comprises contacting said solution with a composite comprising a derivatized, polysaccharide matrix covalently coupled to an antibody selected from a group consisting of primary and secondary antibodies via a bifunctional coupling agent having a formula



wherein *n* is an integer from 1 to 6 and wherein *e* is an integer from 1 to 2; and wherein said derivatized polysaccharide matrix comprises an activated, polysaccharide matrix coupled to an α,ω-diaminospacer via one of said α,ω-diaminospacer's amino groups.

4,081,247

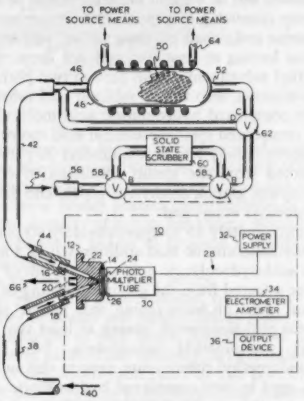
METHOD AND APPARATUS FOR THE CHEMILUMINESCENT DETECTION OF HCL

Radhakrishna Murty Neti, and Carl Nelson Cederstrand, both of Brea, Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed Feb. 2, 1976, Ser. No. 654,442
Int. Cl.[2] G01N *21/22, 21/52, 25/20*
U.S. Cl. 23—232 E **11 Claims**

9. Apparatus for measuring the concentration of a hydrogen halide in a gas stream comprising:

(a) a conversion chamber having inlet means thereto and outlet means therefrom;
(b) vitreous carbon disposed within said conversion chamber;
(c) means for heating said vitreous carbon cooperating with said conversion chamber;
(d) scrubber means for removing hydrogen halide from the gas stream communicating with said inlet means to said conversion chamber;
(e) first valve means cooperating with said inlet means to said conversion chamber and said scrubber means wherein when said first valve means is in a first position the gas stream passes through said scrubber means before entering



said conversion chamber and when said first valve means is in a second position the gas stream does not pass through said scrubber means before entering said conversion chamber;
(f) a reaction chamber having a pair of inlets for mixing gases in said reaction chamber and an exhaust passage, one of said inlets being connected to said outlet means of said conversion chamber and the other of said inlets being adapted to be connected to a source of ozone;
(g) a light window positioned in said reaction chamber so that the light emitted by a chemiluminescent reaction between the gases in said inlets can be measured; and,
(h) means associated with said light window for measuring the light emitted by the chemiluminescent reaction.

4,081,248

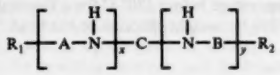
INTERNALLY COATED REACTION VESSEL FOR USE IN OLEFINIC POLYMERIZATION

Louis Cohen, Avon Lake, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Continuation-in-part of Ser. No. 714,317, Aug. 16, 1976, abandoned. This application Mar. 28, 1977, Ser. No. 781,828
Int. Cl.[2] B01J *8/00*
U.S. Cl. 23—285 **49 Claims**

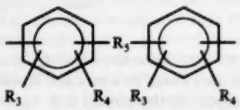
1. A process for substantially eliminating the buildup of polymers on the internal surfaces of a polymerization reaction vessel which comprises applying to said surfaces a coating solution comprised of an aqueous alkali metal hydroxide solution containing from about 0.01 to about 0.10% by weight of a straight chain or branched polyaromatic amine having a molecular weight greater than about 250 and having at least 2 —OH groups per 1000 molecular weight and from about 0.002 to about 0.02% by weight of an aqueous media dispersant selected from the group consisting of polyvinyl alcohol, polyvinyl pyrrolidone, gelatin (calf skin), starch and hydroxy propyl methyl cellulose, the ratio of said polyaromatic amine to said dispersant being in the range of about 10:1 to about 2:1,

said polyaromatic amine having the structure selected from the group consisting of



I.

wherein (1) A, B, and C are selected from the group consisting of



(a)

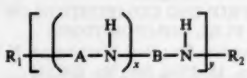
wherein R_3 is —H, halogen, or an alkyl group containing from 1 to 8 carbon atoms and may be the same or different; R_4 is —H, —OH, $—NH_2$ or an alkyl group containing from 1 to 8 carbon atoms and may be the same or different; and R_5 is

or a straight chain or branched alkylene or alkylidene group containing from 1 to 5 carbon atoms; and

(b)

wherein R_3 and R_3 are the same as for (a); and wherein A, B, and C may be the same or different and each repeating unit may be the same or different; (2) R_1 and R_2 are either —H, —OH, $—NH_2$, or

and may be the same or different and wherein R_3 and R_4 are the same as for (a); and (3) x is an integer from 1 to 20 and y is an integer from 0 to 20; and

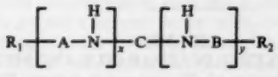


II.

wherein (4) A, B, R_1, R_3, R_4 are same as in I and R_2 is —H, or

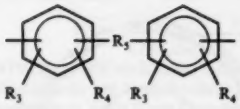
as defined in (2); and (5) x is an integer from 1 to 4 and y is an integer from 1 to 15.

37. A polymerization reaction vessel having on all the internal surfaces thereof a coating comprised of a straight chain or branched polyaromatic amine having a molecular weight greater than about 250 and having at least 2 —OH groups per 1000 molecular weight and an aqueous media dispersant selected from the group consisting of polyvinyl alcohol, polyvinyl pyrrolidone, gelatin (calf skin), starch and hydroxy propyl methyl cellulose, the ratio of said polyaromatic amine to dispersant being in the range of about 10:1 to about 2:1, said polyaromatic amine having the structure selected from the group consisting of



I.

wherein (1) A, B, and C are selected from the group consisting of



(a)

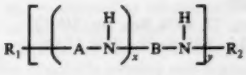
wherein R_3 is —H, halogen, or an alkyl group containing from 1 to 8 carbon atoms and may be the same or different; R_4 is —H, —OH, $—NH_2$ or an alkyl group containing from 1 to 8 carbon atoms and may be the same or different; and R_5 is

or a straight chain or branched alkylene or alkylidene group containing from 1 to 5 carbon atoms; and

(b)

wherein R_3 and R_4 are the same as for (a); and wherein A, B, and C may be the same or different and each repeating unit may be the same or different; (2) R_1 and R_2 are either —H, —OH, $—NH_2$, or

and may be the same or different and wherein R_3 and R_4 are the same as for (a); and (3) x is an integer from 1 to 20 and y is an integer from 0 to 20; and



II.

wherein (4) A, B, R_1, R_3, R_4 and R_5 are the same as in I and R_2 is —H, or

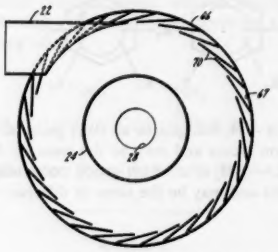
as defined in (2); and (5) x is an integer from 1 to 4 and y is an integer from 1 to 15.

4,081,249

CHEMICAL CONVERSION APPARATUS AND METHOD

Lloyd A. Baillie, Homewood, Ill., assignor to Atlantic Richfield Company, Philadelphia, Pa.

Filed Feb. 23, 1976, Ser. No. 660,207
Int. Cl.[2] B01D *45/12;* **B01J** *8/24, 37/12;* **C10G** *13/18*
U.S. Cl. 23—288 S **97 Claims**



1. In an apparatus for carrying out chemical conversion of a feedstock which includes a chemical reaction zone wherein said feedstock is contacted with solid particles capable of promoting said chemical conversion at chemical conversion conditions to form at least one chemical conversion product and a mixture of solid particles and vapor, the major portion by weight of said solid particles having diameters in the range from about 10 to about 500 microns; and at lease one separation means in fluid communication with said reaction zone wherein said mixture is at least partially separated, said separation means comprising a chamber defined by an interior cylindrical surface; an inlet means in fluid communication with both said reaction zone and said chamber to allow entry of said mixture to said chamber, said inlet means being situated so that the movement of said mixture in said chamber causes solid particles to preferentially move toward said cylindrical surface; a fluid outlet means in fluid communication with said chamber to allow at least a portion of said vapor component of said mixture to exit from said chamber; and a particle outlet means in fluid communication with said chamber to allow at least a portion of said solid particles to exit from said chamber; the improvement which comprises:

arresting means located in spaced relation to said interior cylindrical surface to slow the velocity of at least a portion of said solid particles as said solid particles preferentially move toward said cylindrical surface, thereby inhibiting the attrition of said solid particles.

4,081,250

COAL DESULFURIZATION PROCESS

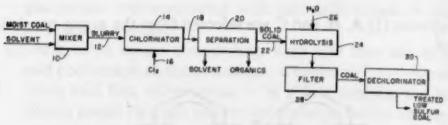
George C. Hsu, La Crescenta; George R. Gavalas; Partha S. Ganguli, both of Pasadena, and Sarkis H. Kalfayan, La Canada, all of Calif., assignors to California Institute of Technology, Pasadena, Calif.

Filed Aug. 27, 1976, Ser. No. 718,137
Int. Cl.[2] C10L *9/10;* **C10B** *57/00*
U.S. Cl. 44—1 R **20 Claims**

1. A method of desulfurizing particulate coal comprising the steps of:

suspending the coal in an organic solvent having a boiling point below 120° C and having good resistance to consumption of chlorine to form a slurry;

chlorinating the coal by adding chlorine gas to the coal slurry at a temperature below 120° C for a time sufficient to add 10 to 50% by weight chlorine to the coal;



separating chlorinated coal from the solvent;

suspending the chlorinated coal in water and leaching water soluble sulfur compounds therefrom; and

recovering chlorinated desulfurized coal.

4,081,251

PROCESS TO REMOVE IRON SULFIDE FROM COAL TO REDUCE POLLUTION

Albert J. Colli, Oxon Hill, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation-in-part of Ser. No. 702,839, Jul. 6, 1976, abandoned. This application Oct. 1, 1976, Ser. No. 728,709
Int. Cl.[2] C10L *9/10*
U.S. Cl. 44—1 R **12 Claims**

1. A method of physically reducing the amount of sulfur in coal, which comprises the steps of:

grinding the coal to a particle size of less than 100 microns in diameter;

selecting a particle size cut off point which lies between 3 and 50 microns in diameter;

spearating said particles at the particle size cut off point into a fine coal rich fraction and a first course pyrite rich fraction;

diluting said first coarse pyrite rich fraction with a liquid hydrocarbon carrier to decrease intraparticle forces and help prevent agglomerations; and

passing said dilute coarse pyrite rich fraction through a magnetic separator, so as to separate the dilute coarse pyrite rich fraction into a second coarse pyrite rich fraction and dilute coarse coal rich fraction.

7. The method of claim 1 wherein said liquid hydrocarbon carrier is selected from a group consisting of Number 2, Number 3, Number 4, Number 5 and Number 6 fuel oil, kerosene and gasoline.

4,081,252

METHOD OF IMPROVING COMBUSTION OF FUELS AND FUEL COMPOSITIONS

Hans Osborg, 80 Longview Rd., Port Washington, N.Y. 11050

Filed Jun. 16, 1976, Ser. No. 696,530
Int. Cl.[2] C10L *1/22, 1/12*
U.S. Cl. 44—53 **5 Claims**

1. A composition, which comprises;

from 85 to 99.5 percent by weight of a petroleum distillate; and

from 0.5 to 15 percent by weight of a hydrogen carrier, said hydrogen carrier being a compound of hydrogen and at least one element selected from the group consisting of lithium, sodium, potassium and magnesium, said compound having a molecular weight of from 8 to about 125, a heat of formation of from about 10 kcal. to about 100 kcal. per mole; provided that the compound selected is non-reactive with the petroleum distillate it is mixed in at ambient temperatures, does not lower the shelf life of the composition, does not deteriorate below the ignition temperature of said composition to release energy and at the

point of ignition, releases energy and hydrogen, said composition being non-hypergolic.

2. A method of improving the combustion of alcohols having 1 to 16 carbon atoms, inclusive, and a molecular weight of from 17 to 275, which comprises; mixing in said alcohol from 0.5 to 15 percent by weight of a hydrogen carrier; and combusting the resulting mixture; said hydrogen carrier being a compound of hydrogen and at least one element selected from the group consisting of lithium, sodium, potassium, magnesium, aluminum and boron, said compound having a molecular weight of from 8 to about 125, a heat of formation of from about 10 kcal. to about 100 kcal. per mole; provided that the compound selected is non-reactive with the alcohols it is mixed in at ambient temperatures, does not lower the shelf life of the mixture, does not deteriorate below the ignition temperature of said mixture to release energy and at the point of ignition, releases energy and hydrogen, said mixture being non-hypergolic.

5. A composition, which comprises;

from 85 to 99.5 percent by weight of an alcohol having 1 to 16 carbon atoms, inclusive, and a molecular weight of from 17 to 275; and

from 0.5 to 15 percent by weight of a hydrogen carrier, said hydrogen carrier being a hydrazine compound, said compound having a molecular weight of from 8 to about 125, a heat of formation of from about 10 kcal. to about 100 kcal. per mole; provided that the compound selected is non-reactive with the alcohol it is mixed in at ambient temperatures, does not lower the shelf life of the composition, does not deteriorate below the ignition temperature of said composition to release energy and at the point of ignition, releases energy and hydrogen, said composition being non-hypergolic.

4,081,253

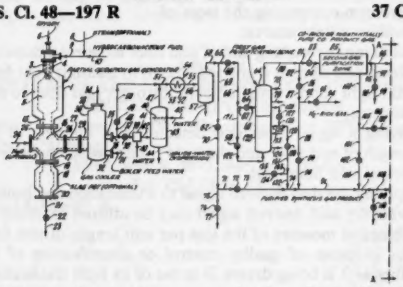
PRODUCTION OF PURIFIED SYNTHESIS GAS AND CARBON MONOXIDE

Charles P. Marion, Mamaroneck, N.Y., assignor to Texaco Development Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 749,657, Dec. 10, 1976. This application Jun. 28, 1977, Ser. No. 810,709

Int. Cl.[2] C10J *3/00*

U.S. Cl. 48—197 R **37 Claims**



1. Process for simultaneous production of a product stream of purified synthesis gas and a product stream of CO-rich gas, comprising:

(1) reacting a hydrocarbonaceous feedstock with a free-oxygen-containing gas, optionally in the presence of a temperature moderator, in the reaction zone of a free-flow noncatalytic partial-oxidation gas generator at a temperature in the range of about 1300° to 3000° F and at a pressure in the range of about 1 to 250 atmospheres to produce an effluent gas stream comprising H_2, CO, H_2O, CO_2, and optionally at least one material from the group H_2S, COS, CH_4, N_2, A_r, and solid particles;

(2) removing a portion of said solid particles if present, cooling the effluent gas stream by indirect heat exchange in a separate heat-exchange zone, removing any remaining entrained solid particles, and dehumidifying the cooled gas stream;

(3) introducing at least a portion of the clean dehumidified gas stream from (2) into a first gas-purification zone and by-passing said first gas-purification zone with the remainder if any; removing from the gas stream in said first gas-purification zone any H_2S, COS, and at least a portion of the CO_2;

(4) introducing partially purified gas from the first gas purification zone in (3) into a second gas-purification zone and by-passing said second gas-purification zone with at least a portion of the remainder, if any, and removing from said second gas-purification zone said product stream of CO-rich gas and a separate stream of H_2-rich gas; and

(5) mixing together at least a portion of the H_2-rich gas from (4) with at least a portion of at least one of the following:

(a) gas processed in the first gas purification zone that by-passes the second gas purification zone in (4);

(b) soot-free dehumidified gas that by-passes the first gas-purification zone in (3); producing said product stream of purified synthesis gas having a controlled H_2/CO mole ratio.

4,081,254

METHOD OF TEMPERING GLASS PRODUCT

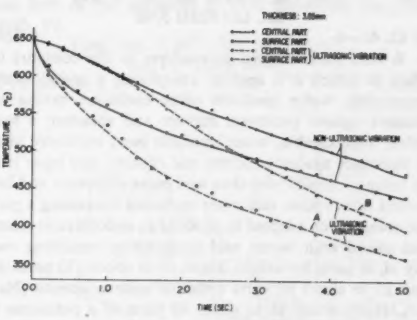
Kuniharu Matsumoto, and Norihiko Shinkai, both of Yokohama, Japan, assignors to Asahi Glass Company, Ltd., Tokyo, Japan

Filed Apr. 28, 1977, Ser. No. 791,791

Claims priority, application Japan, May 7, 1976, 51-51329

Int. Cl.[2] C03B *27/00*

U.S. Cl. 65—116 **4 Claims**



1. In a method of tempering a glass product by a heat treatment of quenching a glass product heated at higher than a strain point and lower than a softening point by dipping it into a liquid coolant, an improvement which comprises applying ultrasonic vibration to said liquid coolant or said glass product in the quenching operation.

4,081,255

SYSTEM FOR FILTERING STACK GASES

Gary L. Evans, Rt. 1, Box 139A, Junction City, Ark. 71749

Filed Aug. 16, 1976, Ser. No. 715,129

Int. Cl.[2] B01D *47/00*

U.S. Cl. 55—230 **29 Claims**

1. A system for filtering industrial waste gases comprising:

an in-feed exhaust duct;

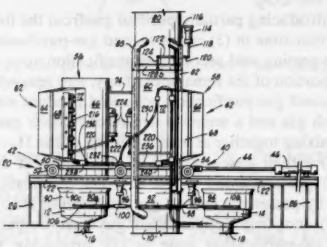
a discharge exhaust duct positioned substantially vertically above, and spaced from, said in-feed exhaust duct;

a pair of filter vat cleaners spaced from said in-feed exhaust duct and positioned at substantially the same horizontal level as said in-feed exhaust duct;

a pair of horizontally spaced filtering means; and

means for cyclically moving said horizontally spaced filtering means between a first position, at which one of said filtering means is disposed between, and in alignment with, said in-feed exhaust duct and said discharge exhaust

duct and the other of said filtering means is positioned over, and in alignment with, one of said vat cleaners, and a second position, at which said other filtering means is



disposed between, and in alignment with, said in-feed exhaust duct and said discharge exhaust duct, and said one filtering means is positioned over, and in alignment with, the other of said vat cleaners.

4,081,256

ENDOTHERMIC COMPOSITION AND COLD PACK

William R. Donnelly, Piqua, Ohio, assignor to Readi Temp, Inc., Piqua, Ohio

Filed Dec. 3, 1976, Ser. No. 747,198
Int. Cl.[2] F25D *5/02*
U.S. Cl. 62—4 **5 Claims**

3. A cold pack adapted to conform to the contours of a surface to which it is applied, comprising a sealed flexible, impermeable, water insoluble outer enclosure having high resistance against puncture, rupture and abrasion; a sealed flexible, impermeable, water insoluble inner enclosure having low resistance against puncture and rupture, said inner enclosure being of smaller size than said outer enclosure and being disposed therewithin; said outer enclosure containing a particulate composition adapted to produce an endothermic reaction when mixed with water, said composition consisting essentially of, in parts by weight, about 65 to about 130 parts urea, about 35 to about 80 parts hydrated sodium acetate ($Na\ C_2H_3O_2.3H_2O$), about 18 to about 40 parts of a potassium salt selected from the group consisting of potassium chloride, potassium nitrate, and mixtures thereof, about 18 to about 30 parts ammonium chloride, and about 6 to about 10 parts guar gum; said inner enclosure containing about 85 to about 140 l parts water, whereby rupture of said inner enclosure causes said water to contact said composition and produce an endothermic reaction and a gelling of said composition into a moldable mass.

4,081,257

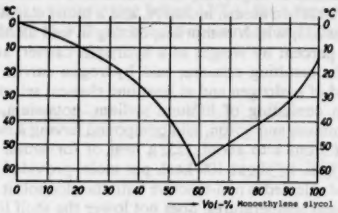
FREEZE REGENERATION OF GLYCOL SOLUTIONS LOADED WITH WATER

Eberhard Lassmann, Herrnhausen, and Heinz Karwat, Pullach, both of Germany, assignors to Linde Aktiengesellschaft, Wiesbaden, Germany

Filed Mar. 30, 1976, Ser. No. 671,991
Claims priority, application Germany, Apr. 1, 1975, 2514210
Int. Cl.[2] B01D *9/04*; C07C *29/24, 41/12*
U.S. Cl. 62—532 **20 Claims**

1. A process for the regeneration of glycol solutions loaded with water, wherein the solution is cooled to below its ice point without deleterious subcooling to form a crystal slurry, and the thus-crystallized ice is separated from the remaining glycol solution.

9. In a defogging process comprising passing fog over cold heat exchange surfaces to condense out water thereon, washing said heat exchange surfaces with a glycol-water mixture to remove the ice and load the mixture with additional water, and regenerating resultant loaded glycol-water mixture,



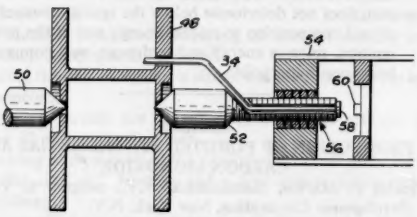
wherein the improvement comprises regenerating in accordance with the process of claim 1.

4,081,258

METHOD FOR USING ON LINE OPTIC FIBER LOSS MONITOR

James E. Goell; Gary W. Bickel; Charles K. Kao, and Mokhtar S. Maklad, all of Roanoke, Va., assignors to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed May 12, 1976, Ser. No. 685,861
Int. Cl.[2] C03B *37/02*
U.S. Cl. 65—2 **13 Claims**



1. A method of monitoring the loss characteristics of a length of an optical fiber as it is being drawn from an optical fiber preform comprising the steps of:

providing a light source;

positioning the starting end of said fiber adjacent a detector;

utilizing said fiber as it is being drawn to transmit light from said light source longitudinally through said fiber to said detector;

deriving a signal from said detector as a function of the length of said fiber and the light transmission characteristics of said fiber; and

supplying the thus derived signal to a utilization mechanism, whereby said derived signal may be utilized to obtain an objective measure of the loss per unit length of said fiber for purposes of quality control or identification of the fiber as it is being drawn in terms of its light transmission characteristics.

4,081,259

METHOD FOR FORMING COATED CELLULAR GLASS PELLETS

Morton Bassin, and Eugene Tseng, both of Northridge, Calif., assignors to Maryland Environmental Service, Annapolis, Md.

Filed Sep. 23, 1976, Ser. No. 725,700
Int. Cl.[2] C03B *19/08*
U.S. Cl. 65—21 **10 Claims**

1. A method of forming small, smooth surfaced foamed glass pellets comprising:

(a) crushing solid waste glass to a particle size of less than −200 mesh;

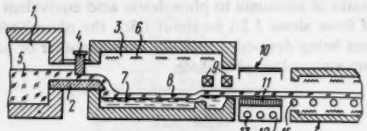
(b) adding water to said glass particles substantially uniformly wetting said fine glass particles;

(c) forming said wet glass particles into small pellets;
(d) coating said pellets release agent having a substantially higher melting point than said glass particles;
(e) heating said coated glass to a temperature above the softening point of said glass to cellulate said glass;
(f) cooling said coated cellulated glass pellets.

4,081,260
PROCESS FOR MAKING SHEET GLASS ON A FLUID SUPPORT

Mark Leonovich Glikman, ploschad Kommunarnaya, 11, Kv.45, Saratov; Jury Mikhailovich Tjurin, Belovezhskaya ulitsa, 61, Kv.131, Moscow; Gennady Nikolaevich Gorshkov, ulitsa Michurina, 114, Kv.1, Saratov; Vladilen Alexandrovich Gorokhovsky, ulitsa Lomonosova, 3, Kv.9, Saratov; Alexei Georgievich Shabanov, ulitsa Lampovoya, 3, Kv.35, Saratov; Zakhor Isaevich Sapunar, ulitsa Mezhdunarodnaya, 26, Kv.31, Saratov; Albert Vladimirovich Avrus, ulitsa Zagorodneva, 15, Kv.77, Saratov; Evgeny Borisovich Fainberg, Okyabrsky poselok, 8 Linia, 32, Saratov, all of U.S.S.R.

Filed Dec. 13, 1976, Ser. No. 749,998
Int. Cl.² C03B *18/02*
U.S. Cl. 65—25 A **1 Claim**

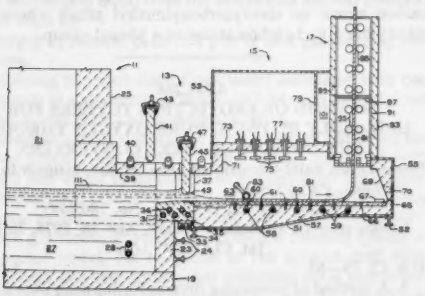


1. A process for making sheet glass comprising feeding glass mass to the surface of molten metal in a bath having an outlet portion including an end wall, said end wall having a top edge, for forming a glass strip of the mass; cooling said glass strip as it flows along said melt surface; maintaining the level of the molten metal above said top edge of said end wall in the area of the outlet portion by inductor means; rectilinearly transferring said glass strip from said metal melt to a gas cushion for further cooling of said strip; said glass strip is transferred to said gas cushion at a temperature of said strip from 650° to 700° C.

4,081,261
APPARATUS AND METHOD FOR COOLING A GLASS RIBBON FORMING CHAMBER

Robert L. Tilton, Wexford, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Mar. 9, 1977, Ser. No. 776,021
Int. Cl.² C03B *18/02*
U.S. Cl. 65—65 A **6 Claims**



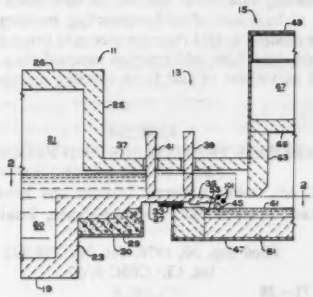
1. In an apparatus for forming flat glass comprising an enclosed forming chamber having a casing and a refractory liner containing a pool of glass-supporting molten metal and having at least one cooler extending through a portion of the refractory liner beneath a lower surface of the pool of molten metal for removing heat from the pool of molten metal, the improvement which comprises a refractory liner having an opening extending through a sufficient portion of it for providing communication between the pool of molten metal and the cooler with metal of the pool of molten metal substantially filling said opening and surrounding the portion of the cooler in communication with it.

4. In a method of forming flat glass wherein a layer of molten glass is delivered onto the surface of a pool of molten metal maintained in a refractory liner disposed in a casing, and wherein the layer of glass is advanced along the surface of the pool of molten metal while being cooled to form a continuous sheet of flat glass, at least a portion of the cooling being by heat transfer from the glass to the pool of molten metal and thence through a portion of the refractory liner to coolers in the refractory liner, the improvement which comprises transferring heat directly from the metal to a cooler in the liner at a location beneath a lower surface of the pool of molten metal by contacting the cooler with a portion of the metal through an opening in the refractory liner.

4,081,262
USE OF REDUCING GAS CURTAIN FOR START OF GLASS FORMING PROCESS

Philip K. Fuhrman, Freeport, and Robert A. Greiner, Jr., Tarentum, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Aug. 3, 1977, Ser. No. 821,451
Int. Cl.² C03B *18/02*
U.S. Cl. 65—65 A **6 Claims**



1. In a method of preparing a glass forming chamber for receiving molten glass onto a pool of molten metal for forming wherein an enclosed chamber having a pool of tin-containing metal therein is heated to melt the metal and is filled with a non-oxidizing atmosphere to prevent the oxidation of the metal and wherein residual oxygen and metal oxide in the vicinity of the chamber immediately adjacent where molten glass is to be delivered thereto contaminates initially delivered glass, the improvement which comprises

establishing a curtain of reducing gas transversely across a molten glass inlet end of the glass forming chamber substantially immediately above a molten glass-supporting refractory adjacent the metal onto which molten glass is to be delivered;

maintaining the curtain of reducing gas as the metal is melted and as molten glass is initially delivered onto the molten metal whereby the molten glass is initially delivered onto a molten metal surface having a stream of reducing gas impinging onto it; and thereafter

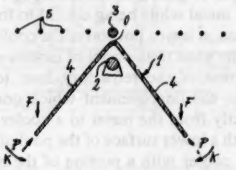
terminating the curtain of reducing gas, preventing the direct impingement of gas against the molten glass.

4,081,263

METHOD AND APPARATUS FOR BENDING A SHEET OF VITREOUS MATERIAL

Pierre Mestre, Maubeuge, and José Payen, Assevent, both of France, assignors to BFG Glassgroup, Paris, France

Filed Jan. 13, 1977, Ser. No. 758,919
Claims priority, application France, Jan. 14, 1976, 76 00824
Int. Cl.[2] C03B *23/02*
U.S. Cl. 65—106 **27 Claims**



1. A method of bending a sheet of vitreous material which comprises the steps of heating the sheet, and causing the sheet to bend relative to a contacting reaction means by initiating the bending of the sheet while it is in contact with said reaction means and then separating the sheet and said reaction means before completion of the bending operation.

12. Apparatus for bending a vitreous sheet while it is in heated condition, comprising reaction means for contacting a sheet at at least one place to allow bending of the sheet relative to said means, opposed force exerting members disposed abreast of said reaction means, means for effecting a relative approach movement of said force exerting members for applying bending forces on opposed margins of the sheet to cause bending at said place, and opposed sheet supporting members for supporting said sheet abreast of said place during said bending, at least one of said supporting members being displaceable relative to said reaction means to bring about separation of said sheet from said reaction means during said relative approach movement of said force exerting members.

4,081,264

SLOW RELEASE FERTILIZERS AND PROCESSES FOR PREPARING SAME

Wahid R. Ali, Pointe-a-Pierre, Trinidad and Tobago, assignor to Texaco Trinidad Inc., Pointe-a-Pierre, Trinidad and Tobago

Filed Sep. 30, 1976, Ser. No. 728,322
Int. Cl.[2] C05C *9/00*
U.S. Cl. 71—28 **4 Claims**

1. A process for preparing a slow release fertilizer comprising providing a substrate of coarsely divided fertilizer particles of a diameter ranging from about 2.5 to 4.5 mm, spraying a first coating of molten sulfur at a temperature of 125 to 170° C as a jet of .005 to 0.1 inches in diameter onto said particles; solution coating said sulphur-coated particles with a solution of bitumen in a low boiling inert solvent; removing said solvent by distillation and spraying the remaining particles with a mineral powder to produce free flowing particles of fertilizer encapsulated in sulfur and bitumen.

4,081,265

POT WATER

Ricks H. Pluenneke, P.O. Box 128, Fort Worth, Tex. 76101

Filed Aug. 27, 1976, Ser. No. 718,316
Int. Cl.[2] C05D *9/00*
U.S. Cl. 71—33 **10 Claims**

1. A method of providing a complete treatment for containerized plants in soil so that treatment thereof with tap water is avoided, said method comprising the step of

periodically applying to a containerized plant in soil a water solution with a pH between 5.8 and 6.4 having less than about 10 ppm sodium, and 5 ppm chlorine, and having at least 6 ppm nitrogen, in nitrate form, 6 ppm phosphate, 25 ppm potassium, 3.6 ppm magnesium, 14 ppm sulphate and 0.05 ppm iron, in place of water and fertilizer, so that healthy plant growth is achieved.

4,081,266

STABLE FLUID SUSPENSION FERTILIZER COMPOSITION AND METHOD FOR PRODUCING SAME

H. C. MacKinnon, Tulsa, Okla., assignor to Agrico Chemical Company, Tulsa, Okla.

Filed Dec. 22, 1975, Ser. No. 642,776
Int. Cl.[2] C05B *7/00*
U.S. Cl. 71—36 **12 Claims**

1. An improved, stable fluid suspension fertilizer composition produced by admixing into an aqueous medium from about 8 to about 75 weight percent monoammonium phosphate, from about 1 to about 6 weight percent ammonia, from about 1 to about 3 weight percent clay particles and from 0 to about 50 weight percent potash at a temperature of less than about 130° F, said mixing being at a rate sufficient to shear said clay particles, said composition having total equivalant water in the range of from about 25 to about 60 weight percent and a mole ratio of ammonia to phosphoric acid equivalent in the range of from about 1.2:1 to about 1.8:1, the phosphoric acid equivalent being derived essentially from granular or particulate mono-ammonium phosphate.

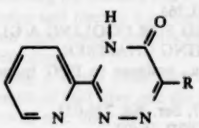
4,081,267

PYRIDYLTRIAZINONE HERBICIDAL COMPOSITIONS

Shunichi Hashimoto, Takarazuka; Osamu Kirino, Ashiya; Toshiaki Ozaki, Toyonaka, and Norihisa Yamashita, Takarazuka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Jan. 15, 1976, Ser. No. 649,320
Claims priority, application Japan, Feb. 14, 1975, 50-19041
Int. Cl.[2] A01N *9/22*
U.S. Cl. 71—93 **6 Claims**

1. A method of controlling undesired vegetation which comprises applying to the locus thereof an effective amount of a herbicidal composition comprising a pyridyltriazinone compound of the formula:



wherein R is a hydrogen atom, an alkyl group having 1 to 5 carbon atoms, an alkoxycarbonylmethyl group wherein the alkoxy has 1 to 3 carbon atoms or a phenyl group.

4,081,268

METHOD OF PROTECTING TUYERES FOR UPWARDLY BLOWING PURE OXYGEN THROUGH THE BOTTOM OF STEEL CONVERTERS

Pierre Leroy, Saint-Germain-en-Laye, France, assignor to Creusot-Loire, Paris, France

Filed Apr. 12, 1977, Ser. No. 786,949
Claims priority, application France, Apr. 28, 1976, 76 12544
Int. Cl.[2] C21C *5/34*
U.S. Cl. 75—52 **8 Claims**

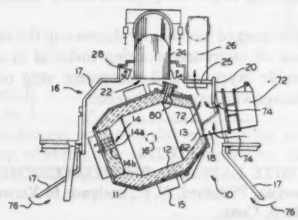
1. A method of protecting tuyeres for blowing pure oxygen through the bottom of a steel converter, the method comprising supplying a protective liquid which contains hydrocarbons to peripheral passage means in each tuyere and varying the rate of flow of said protective liquid, so that said protective liquid flows at a reduced rate during a first stage, which first stage extends from the beginning of the refining process to a point at

which the carbon level in the molten metal is 0.300 to 0.700%, and at a normal rate during a second stage, which second stage extends from the end of said first stage to a point at which 90 to 95% of the total amount of oxygen required for refining the molten metal has been blown in, and at an excess rate during a third and final stage, which third stage extends from the end of said second stage to the point at which all the oxygen has been blown in, said normal flow rate being in the range 0.08 to 0.15 liters per minute per centimeter the mean circumference of said passage means in each tuyere through which said protective liquid flows, said reduced flow rate being from 0.4 to 0.6 times said normal flow rate and said excess flow rate being from 1.5 to 2 times said normal flow rate.

4,081,269
GAS CLEANING SYSTEM FOR METALLURGICAL APPARATUS

Harold Nomine, Essen, Germany, and Eberhard G. Schempp, Pittsburgh, Pa., assignors to Pennsylvania Engineering Corporation, Pittsburgh, Pa.

Filed Jan. 7, 1976, Ser. No. 647,112
Int. Cl.² C21C 5/38
U.S. Cl. 75—60 **5 Claims**



1. A method of controlling emissions from one of a plurality of open ended metallurgical vessels, each vessel including a surrounding enclosure having an access door and a primary and a secondary gas collecting hood means, the primary and secondary hood means of each enclosure also being coupled to an individual gas cleaning system associated with each vessel, each gas cleaning system having exhaust draft producing means and each secondary hood means being above the access door of its respective enclosure, said vessels each including tuyere means for injecting process gases beneath the level of molten metal and each vessel being tiltable from a normal blowing position wherein an open end of the vessel is beneath the primary gas collecting hood means and secondary positions wherein the open end of the vessel is displaced from the primary gas collecting hood means for receiving a metallic charge or for discharging metal from the vessel, said method comprising the steps of:

inducing an exhaust draft in a pair of said gas cleaning systems,

positioning the open end of one vessel associated with one system in a secondary position with its open end adjacent the access door and opening the latter,

creating an indraft at said open access door by restricting the one primary gas collecting hood means associated with said one vessel to minimize the exhaust draft flow therethrough and connecting the one secondary gas collecting hood means associated with said one vessel to its associated gas cleaning system and to the gas cleaning system of another vessel, the reduction of the exhaust draft flow through said one primary gas collecting hood means acting to increase the flow through said one secondary gas collecting hood means,

delivering a hot metal charge to said one vessel,

closing said access door and turning said one vessel to its blowing position and into alignment with said one primary gas collecting hood means,

unrestricting said primary gas collecting hood means for increasing the flow therethrough and disconnecting the one secondary gas collecting hood means from its associated gas cleaning means while maintaining the connection of said one secondary gas collecting hood means with the gas cleaning means of said another vessel to ventilate said enclosure, and moving said one primary hood means into proximity with the open end of said vessel,

and introducing oxygen through said tuyere means and beneath said metal charge.

4,081,270
RENITROGENATION OF BASIC-OXYGEN STEELS DURING DECARBURIZATION

Paul Arthur Tichauer, Chappaqua, N.Y.; James Stephen Adams, Grosse Ile, Mich., and Henry Desmont Thokar, Aurora, Ohio, assignors to Union Carbide Corporation and National Steel Corporation, both of New York, N.Y.

Filed Apr. 11, 1977, Ser. No. 786,593
Int. Cl.² C21C 5/30
U.S. Cl. 75—60 **9 Claims**

1. In a process for the production of steel by decarburizing a ferrous melt contained in a vessel by blowing oxygen into the melt from above the surface thereof, the improvement comprising:

producing steel having a high nitrogen content, within a preselected range by:

(a) introducing a nitrogen-rich gas into the melt, simultaneously with said oxygen during the latter portion of the decarburization step, in an amount at least equal to 100 NCF of nitrogen gas per ton of molten metal, and in such manner as to promote intensive interaction of the nitrogen-rich gas with the molten metal,

(b) refining the melt with the oxygen and nitrogen-rich gas by blowing the melt to a final manganese content at least as low as 0.10 percent, and

(c) maintaining the partial pressure of nitrogen in the vessel head-space at least equal to that calculated to be in equilibrium with the aim dissolved nitrogen content of the molten metal at 1600° C.

4,081,271
PROCESS FOR SEPARATING AND RECOVERING RHODIUM AND IRIDIUM FROM THEIR MIXTURES WITH OTHER PRECIOUS METALS

Renato Ugo, Cinisello Balsamo (Milan), Italy, assignor to PROTEC Process e Tecnologie S.P.A., Milan, Italy

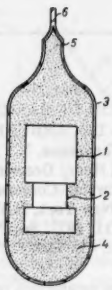
Continuation of Ser. No. 676,429, Mar. 12, 1976, abandoned. This application Mar. 22, 1977, Ser. No. 780,103
Claims priority, application Italy, Mar. 27, 1975, 21715/75
Int. Cl.² C22B 11/04
U.S. Cl. 75—108 **6 Claims**

1. A process for separating and recovering rhodium and/or iridium from the other precious metals selected from the group consisting of palladium, platinum, ruthenium, osmium, gold and silver, wherein a solution having a pH between 0 and 4 and containing said precious metals in a total concentration of at least 100 ppm is contacted for a time between 15 minutes and 10 hours with carbon monoxide in the presence of a quantity of water or primary or secondary alcohol at least equal in weight to the total quantity of precious metals present at a temperature between 20° and 100° C and at a CO pressure between 1 and 20 atmospheres and thereafter the crystalline precipitate formed which contains all of the precious metals except rhodium and iridium is separated.

4,081,272
METHOD FOR HOT ISOSTATIC PRESSING POWDER BODIES

Jan Adlerborn, Robertsfors, Sweden, assignor to ASEA Aktiebolag, Vesteras, Sweden

Filed Feb. 3, 1976, Ser. No. 654,599
Claims priority, application Sweden, Feb. 3, 1975, 7501140
Int. Cl.² B22F 3/14
U.S. Cl. 75—223 **4 Claims**



1. Method for manufacturing objects by isostatic pressing of a preformed powder body enclosed in a deformable casing at such an elevated temperature and such a pressure that the powder grains are bonded and the body is compressed to a density near the theoretically possible density, which comprises:

(a) preforming a body of powder;

(b) arranging the body in a glass capsule of a first material and embedding the body in a glass powder of a second material with a higher softening temperature than the first material;

(c) evecuating and sealing the capsule with the embedded body;

(d) heating the capsule with its contents to at least the softening temperature of the first material and subjecting it in a pressure furnace to an isostatic pressure from a pressure medium.

4,081,273
MIGRATION IMAGING METHOD

William L. Goffe, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

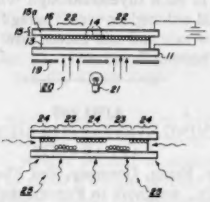
Continuation-in-part of Ser. No. 327, Jan. 2, 1970, abandoned, Ser. No. 854,596, Sep. 2, 1969, Ser. No. 837,780, Jun. 30, 1969, and Ser. No. 460,377, Jun. 1, 1965, Pat. No. 3,520,681. Said Ser. No. 327 is a continuation-in-part of said Ser. No. 854,596 and said Ser. No. 837,780 is a continuation-in-part of said Ser. No. 460,377 and Ser. No. 725,676, May 1, 1968, abandoned, and Ser. No. 483,675, Aug. 30, 1965. Said Ser. No. 725,676 is a continuation-in-part of said Ser. No. 460,377 and said Ser. No. 483,675 and Ser. No. 403,002 Aug. 12, 1964, abandoned. Said Ser. No. 460,377 and Ser. No. 483,675 is a continuation-in-part of said Ser. No. 403,002.
Int. Cl.² G03G 13/22, 13/12
U.S. Cl. 96—1 PS **53 Claims**

1. An imaging process comprising:

providing an imaging member comprising a substrate, a substantially electrically insulating softenable layer, a fracturable layer of migration marking material contiguous the surface of and contacting the softenable layer spaced apart from the substrate, said softenable layer capable of having its resistance to migration of migration marking material decreased sufficiently to allow migration of migration marking material in depth in said softenable material, and

providing an electically conductive member contacting the surface of said softenable layer spaced apart from the substrate; either said conductive member of said substrate and said softenable layers being at least partially transparent to said activating electromagnetic radiation set forth below;

electrically latently imaging said imaging member by imagewise exposing said member through the transparent side thereof to activating electromagnetic radiation and electrically connecting said electrically conductive member to



a first electrical potential and contacting the substrate to ground or to an electrical potential different from the first electrical potential, said imagewise exposure and electrically connecting steps being substantially simultaneous, and

developing said imaged member by decreasing the resistance to migration of migration marking material in depth in said softenable layer, said development step occurring after said imagewise exposure begins.

4,081,274
COMPOSITE LAYERED PHOTORECEPTOR

Anthony M. Horgan, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Nov. 1, 1976, Ser. No. 737,251
The portion of the term of this patent subsequent to Apr. 27, 1993, has been disclaimed.
Int. Cl.² G03G 5/04, 5/09
U.S. Cl. 96—1 PC **32 Claims**

1. An imaging member comprising a first layer of electrically active charge transport material contained on a supporting substrate, a photoconductive layer overlying said active layer, and a second layer of electrically active charge transport material overlying said photoconductive layer, said photoconductive layer exhibiting the capability of photogeneration of charge carriers and injection of said charge carriers, one of said electrically active layers comprising electrically inactive resinous material having dispersed therein from about 15 to about 75 percent by weight of N,N'-diphenyl-N,N'-bis(phenylmethyl)-[1,1'-biphenyl]-4,4'-diamine and capable of supporting the injection of photogenerated holes from said photoconductive layer and transporting said holes through said layer and the other electrically active layer capable of supporting the injection of photogenerated electrons from said photoconductive layer and transporting said electrons through said layer.

4,081,275
PHOTOGRAPHIC FILM UNITS CONTAINING COLORLESS PARA-NITROBENZYLIDENE DYE-FORMING COMPOUNDS

Derek Davis Chapman, and Thomas Irving Abbott, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 16, 1976, Ser. No. 705,965
Int. Cl.² G03C 7/00, 1/40, 1/84, 5/54
U.S. Cl. 96—3 **28 Claims**

27. In a process of producing a photographic transfer image in color comprising:

a. imagewise-exposing a film unit containing a photographic element comprising comprising a support having thereon at least one photosensitive silver halide emulsion layer

having associated therewith a dye image-providing material;

b. treating said element with an alkaline processing composition in the presence of a silver halide developing agent to effect development of each of said exposed silver halide emulsion layers;

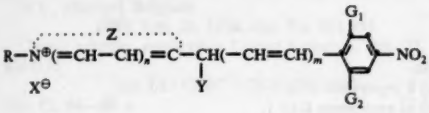
c. an imagewise distribution of dye image-providing material being so formed as a function of development;

d. at least a portion of said imagewise distribution of dye image-providing material diffusing to a dye image-receiving layer;

e. a timing layer associated with a neutralizing layer being permeable by said alkaline processing composition after a predetermined time; and

f. neutralizing said alkaline processing composition by means of said neutralizing layer associated with said photographic element after said predetermined time;

said film unit containing a silver halide developing agent, the improvement wherein said film unit contains a layer containing at least one dye-forming compound having the formula:

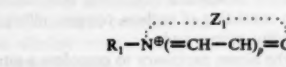


wherein:

n is 0 or 1;

m is 0 or 1;

Y is hydrogen, a carboxylic ester group or a carbamoyl group wherein, if m is 1, Y is hydrogen, and if m is 0, Y can additionally have the formula:



Z and Z_1 independently represent the nonmetallic atoms necessary to complete a pyridine, thiazole, selenazole, quinoline, imidazole and benzimidazole ring;

R and R_1 are independently alkyl containing at least 4 carbon atoms;

p is 0 or 1;

$X^{\ominus}$ is independently an acid anion; and

G_1 and G_2 are independently selected from the group consisting of hydrogen or an electron-withdrawing group except that neither G_1 nor G_2 can be nitro.

4,081,276

PHOTOGRAPHIC METHOD

James V. Crivello, Elnora, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Oct. 18, 1976, Ser. No. 733,235

Int. Cl.[2] G03C *5/00, 5/04;* **G03F** *7/02*

U.S. Cl. 96—35.1 **10 Claims**

1. A photographic method which comprises,

(1) applying a photoinitiator onto a substrate, where the photoinitiator is capable of releasing a cationic polymerization catalyst upon exposure to radiant energy,

(2) exposing at least a portion of the applied photoinitiator to radiant energy, and

(3) effecting contact between such exposed photoinitiator and cationically polymerizable organic material resulting in the production of an adherent organic film, where the photoinitiator has the formula,

$$[Y]_c^+[MQ_d]^{-(d-e)},$$

where Y is a cationic group selected from the class consisting of

$$(R)_a(R^1)_bD$$

$$(R)_f(R^2)_g(R^3)_hE,$$

$$(R)_j(R^4)_k(R^5)_mG,$$

M is selected from a metal or metalloid, Q is a halogen radical, R is a monovalent aromatic organic radical, R^1 is a divalent aromatic organic radical, R^2 and R^4 are monovalent organic aliphatic radicals selected from alkyl, cyclo alkyl and substituted alkyl, R^3 and R^5 are polyvalent organic radicals forming a heterocyclic or fused ring structure with E or G, D is a halogen radical, E is a Group Va element selected from N, P, As, Sb and Bi, G is a Group VIa element selected from S, Se and Te,

"a" is a whole number equal to 0 or 2,

"b" is a whole number equal to 0 or 1 and the sum of "a" + "b" is equal to 2 or the valence of D,

"f" is a whole number equal to 0 to 4 inclusive,

"g" is a whole number equal to 0 to 2 inclusive,

"h" is a whole number equal to 0 to 2 inclusive and the sum of "f" + "g" + "h" is a value equal to 4 or the valence of E,

"j" is a whole number equal to 0 to 3 inclusive,

"k" is a whole number equal to 0 to 2 inclusive and

"m" is a whole number equal to 0 to 1, where the sum of "j" + "k" + "m" is a value equal to 3 or the valence of G, $c = d - e$,

e is equal to the valence of M and is an integer equal to 2–7 inclusive, and

$d > e$ and is an integer having a value up to 8.

4,081,277

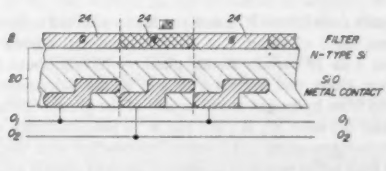
METHOD FOR MAKING A SOLID-STATE COLOR IMAGING DEVICE HAVING AN INTEGRAL COLOR FILTER AND THE DEVICE

Albert Thomas Brault; William Andrew Light, and Thomas William Martin, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 8, 1976, Ser. No. 730,886

Int. Cl.[2] G03C *5/00;* **B03F** *5/00;* **H01J** *1/52;* **D06P** *00/00*

U.S. Cl. 96—38.2 **14 Claims**



1. A method for making a color imaging device that comprises means for sensing radiation comprising a planar array of charge-handling semiconductive photosensors, each defining a

sensing area having at least one dimension that is less than about 100 micrometers, and filter means for controlling the access of radiation to said sensing means, said filter means comprising a plurality of radiation intercepting means defining a planar array of filter elements lying in micro-registration with the sensing area of said photosensors, said method comprising:

superimposing on the array of photosensors the filter means so that filter elements of the intercepting means are in micro-registration with the underlying sensing area of the photosensors, the filter means being formed by a method comprising:

A. coating a layer of photoresist over a transparent, polymeric dye receiving layer;

B. exposing the photoresist to a pattern representing a set of filter elements and developing the photoresist to obtain window areas in the photoresist layer corresponding to said pattern;

C. heating and diffusing heat-transferable dye into the dye receiving layer through the window areas, thus forming dyed filter elements corresponding to said pattern; and

D. removing the remaining portions of the photoresist to yield a first set of dyed filter elements in a planar array in the dye receiving layer.

4,081,278

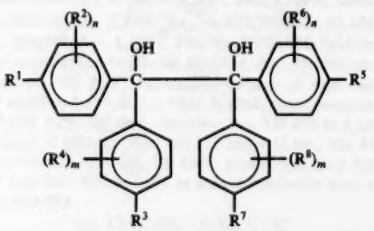
HEAT SENSITIVE DYE LAYERS COMPRISING A BENZOPINACOL

Jonas Dedinas, and George Leland Fletcher, Jr., both of Pittsford, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed May 23, 1977, Ser. No. 799,797
Int. Cl.[2] G03C 1/02, 5/24
U.S. Cl. 96—48 HD **28 Claims**

1. An imaging element comprising a support having thereon a neutral or acidic heat bleachable layer comprising (i) a binder, (ii) a benzopinacol which forms ketyl radicals on heating to a temperature above 100° C and (iii) a reducible dye or a reducible dye precursor that can react with said ketyl radicals.

2. An imaging element according to claim 1 wherein said benzopinacol is represented by the formula:



wherein each R^1 and R^5 is independently selected from halogen atoms, alkyl of about 1 to 10 carbon atoms, alkoxy having about 1 to 10 carbon atoms, phenoxy having about 6 to 12 carbon atoms and hydroxy; R^3 and R^7 are independently selected from hydrogen atoms or any of the groups specified for R^1 and R^5; each R^2, R^4, R^6, and R^8 is independently selected from halogen atoms and from trifluoromethyl with the proviso that both ortho positions on each of the four phenyl groups can be substituted only when both substituents are fluorine; each *n* independently is an integer of from 1 to 4; and each *m* independently is an integer of from 0 to 4.

4,081,279

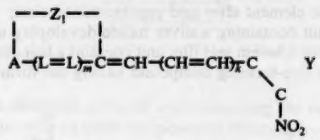
PHOTOTHERMOGRAPHIC MATERIALS CONTAINING RADIATION SENSITIVE QUINONE COMPOUNDS AND NITROBENZYLIDENE DYES

Charles A. Goffe, deceased, late of Brockport, N.Y. (by Patricia Anne Goffe, executrix); Donald W. Heseltine, and Robert E. Bernard, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed May 24, 1976, Ser. No. 689,324
Int. Cl.[2] G03C 5/24, 3/26
U.S. Cl. 96—48 HD **39 Claims**

1. A non-silver halide photothermographic element comprising a support having thereon a layer comprising a radiation sensitive organic compound composition comprising

(1) a radiation sensitive dye represented by the formula



wherein:

(a) k represents 0 or 1;

(b) m represents 0 or 1;

(c) each L represents a methine group;

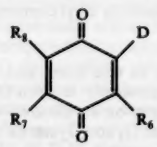
(d) A represents oxygen, sulfur or N-R_1;

(e) R_1 represents alkyl, alkenyl or aryl;

(f) Z_1 represents the nonmetallic atoms necessary to complete a basic, cyanine dye type heterocyclic nucleus forming a 5- or 6-membered heterocyclic ring whose skeletal atoms consist of the oxygen, sulfur or nitrogen atom of A, carbon atoms and one other atom chosen from the group consisting of carbon, oxygen, nitrogen, selenium and sulfur atoms, and

(g) Y represents the atoms necessary to complete a nitro-substituted phenyl or naphthyl group or a carbonyl-substituted phenyl naphthyl group; with

(2) a radiation sensitive quinone compound represented by the formula:



wherein D is selected from the group consisting of alkyl and

R_1 alkyl, aryl, or aralkyl; R_2 is alkyl, aralkyl, or aryl and R_1 and R_2 can, taken together, represent the atoms necessary to form a heterocyclic ring; R_6 is hydrogen, alkyl, aryl, halogen, or alkoxy; R_7 is NHR_2 or

alkyl, aryl, hydrogen, halogen or alkoxy and R_8 is hydrogen, alkyl, aryl, halogen or alkoxy and wherein R_7 and R_8 can, taken together, represent the atoms necessary to form a carbocylic ring; and in the same layer or in an adjacent layer

(a) an organic acid silver salt oxidizing agent,
(b) a non-radiation sensitive reducing agent, and
(c) a binder for said layer.

4,081,280

PROCESSING OF PHOTOGRAPHIC SILVER HALIDE MATERIALS

Hans Josephus Corluy, Berchem; Francsois Leo Schelfaut, St. Niklaas; Pierre Herman Nys, Berchem, and Raoul Jan Börtels, Lier, all of Belgium, assignors to AGFA-GEVAERT N.V., Mortsel, Belgium

Filed Feb. 26, 1976, Ser. No. 661,816

Claims priority, application United Kingdom, Feb. 27, 1975, 8307/75

Int. Cl.² G03C *5/26, 5/24, 5/30*

U.S. Cl. 96—50 A **17 Claims**

1. A process for developing photographic silver halide materials comprising the steps of:

developing latent halftone images in a succession of photographic silver halide emulsion lith-materials in an automatic processing machine with a lith-developer solution consisting essentially of:

hydroquinone developer,

a source of free sulphite ions,

an alkali metal bromide, and

an alkaline compound in sufficient amount to render said solution basic,

said developer containing per liter no more than 0.05 g of any auxiliary developing compound(s) that show(s) super-additive developing effect with said hydroquinone,

periodically during such development checking the performance of said developer solution by developing therein a test sample of the same lith emulsion material being processed which sample has been exposed through at least one sensitometric wedge to produce a halftone or continuous tone test wedge print and (a) comparing the actual distance between areas of different dot value on said test print with a standard distance to determined the deviation between said actual and standard distances, and (b) comparing the location of an actual sensitivity point on said test print with the location of a standard sensitivity point and adding to said developer solution a first replenisher solution R_A in amounts determined by the extent of the deviation found in comparison (a) and a second replenisher solution R_D in amounts determined by the relative location found in comparison (b), said solutions containing the same essential constituents as in said lith-developing solution above in quantities sufficient to meet the following requirements:

1. both replenisher solutions are basic with the pH of R_D being higher than the pH of R_A,
2. the halide ion concentration of R_D is lower than the halide concentration of R_A,
3. the hydroquinone concentration of R_D is different from the hydroquinone concentration of R_A,
4. the free sulphite ion concentration of R_D is lower than the free sulphite ion concentration of R_A; the differences mentioned under (3) and (4) being such that the ratio by weight of the hydroquinone to free sulphite ions in the replenisher R_D is different from the corresponding ratio by weight in replenisher R_A.

4,081,281

DEVELOPING LOW FOGGED, DIRECT-POSITIVE SILVER HALIDE EMULSION WITH AN ENERGETIC DEVELOPER FREE FROM HALIDE IONS

Willy Joseph Vanassche, Aartselaar; Herman Alberik Pattyn, Kapellen, and Hendrik Alfons Borginon, Mortsel, all of Belgium, assignors to AGFA-GEVAERT N.V., Mortsel, Belgium

Continuation of Ser. No. 318,988 Dec. 27, 1972 abandoned. This application Mar. 31, 1975, Ser. No. 563,397

Claims priority, application United Kingdom, Feb. 18, 1972, 7743/72

The portion of the term of this patent subsequent to Jun. 15, 1993, has been disclaimed.

Int. Cl.² G03C *5/24*

U.S. Cl. 96—64 **14 Claims**

1. A method of producing a direct-positive image comprising (1) providing a photographic element comprising at least one direct-positive silver halide emulsion layer with fogged silver halide grains containing electron traps selected from the group consisting of -

(a) silver halide grains having adsorbed to the surface thereof one or more electron-accepting compounds having an anodic polarographic half-wave potential and a cathodic polarographic half-wave potential which when added together give a positive sum, and

(b) silver halide grains, having in their interior, centers which promote the deposition of photolytic silver, said fogging of the silver halide grains producing a density of less than 0.5 when developed without exposure for 6 minutes at 20° C. in Kodak DK-50 developer when such an emulsion is coated on a support at a coverage of 0.50 g to 5.50 g silver per sq.m. and to such an extent that a test portion of the silver halide emulsion, when coated on a support at a coverage of 0.50 to 5.50 g of silver per square meter gives a density of at least 0.50 upon processing without previous exposure for 3 minutes at 20° C. in a test developer of the following composition:

hydroquinone	15 g
1-phenyl-3-pyrazolidinone	1 g
trisodium salt of ethylenediamine tetraacetic acid	1 g
anhydrous sodium carbonate	30 g
anhydrous sodium sulphite	70 g
40% aqueous sodium hydroxide	16 ml
water to make	1 liter (pH:11) ;

(2) imagewise exposing said photographic element to radiation; and (3) developing said exposed photographic element with an alkaline high energy developer selected from the group consisting of hydroquinone/1-phenyl-3-pyrazolidinone developing composition; an ascorbic acid/1-phenyl-3-pyrazolidinone developing composition; hydroquinone/N-methyl-p-aminophenol sulphate developing composition, and a p-phenylene diamine developing composition, said developer being substantially free from halide ions during development.

4,081,282

DRY TRANSFER IMAGE SYSTEMS WITH NON-LIGHT SENSITIVE FRANGIBLE LAYER

Richard E. Merrill, Wakefield, and Theodore H. Krueger, Wayland, both of Mass., assignors to Seal Incorporated, Naugatuck, Conn.

Filed Nov. 3, 1975, Ser. No. 628,506

Int. Cl.² G03C *1/40, 1/76, 5/00*

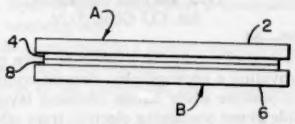
U.S. Cl. 96—77 **10 Claims**

1. A dry image reproduction laminate comprising a photoactive component and a transferable component,

said photoactive component comprising a first support and a single layer of an unexposed photopolymerizable material on said first support, said first support being capable of transmitting radiant energy at a wavelength at which said energy is capable of initiating a photochemical hardening

reaction in said photopolymerizable material, said layer of photopolymerizable material on said first support being tacky,

said transferable component comprising a second support, and an adherent colored layer of a frangible non-photopolymerizable material on said second support, said frangible non-photopolymerizable layer comprising at least one polymer binder and at least one wax, said layers of photopolymerizable and frangible non-photopolymerizable materials being in confronting and adhering relation to one another,



said layer of unexposed photopolymerizable material having an adhesion to said first support which is greater than the adhesion between said layer of frangible non-photopolymerizable material and said second support, and said photopolymerizable material being capable upon hardening of bonding to said frangible non-photopolymerizable material with an adhesive strength greater than the adhesion between said frangible non-photopolymerizable material and said second support.

4,081,283

PLASTER MOLDING COMPOSITION

David R. Lankard, Columbus, and Walter A. Hedden, Worthington, both of Ohio, assignors to PMCMA Research Group, Dayton, Ohio

Filed Feb. 23, 1976, Ser. No. 660,444
Int. Cl.² B28B *7/28*
U.S. Cl. 106—38.3 **9 Claims**

1. A fibrous talc-free metal castings molding composition having good dry blending properties, slurry characteristics, and wet and dry mold features, consisting by weight essentially of: approximately 50–70% gypsum plaster, 5–20% fibrous wollastonite, 5–25% fine expanded perlite, at least 50% of which will pass through a −50 mesh screen, and 0–40% filler.

4,081,284

SILICON CARBIDE-BORON CARBIDE SINTERED BODY

Svante Prochazka, Ballston Lake, N.Y., and William S. Coblenz, Cambridge, Mass., assignors to General Electric Company, Schenectady, N.Y.

Filed Aug. 4, 1976, Ser. No. 711,550
Int. Cl.² C04B *35/56*
U.S. Cl. 106—44 **4 Claims**

1. A polycrystalline sintered body having a density of at least about 85% of the average theoretical density for silicon carbide and boron carbide based on the amounts thereof present consisting essentially of silicon carbide, boron carbide and free carbon, said silicon carbide ranging from α-silicon carbide to β-silicon carbide with all mixtures of α-silicon carbide and β-silicon carbide falling within said range, said silicon carbide having a significantly uniform grain size having an average grain size of less than 10 microns, said boron carbide being present in an amount ranging from about 10% to about 30% by weight based on the total amount of silicon carbide and boron carbide, said boron carbide being significantly uniformly dispersed throughout said body in the form of fine grains, said free carbon being in the form of particles substantially submicron in size present in an amount ranging from about 0.001% by weight to about 1% by weight based on the total amount of silicon carbide and boron carbide.

4,081,285

PORTLAND CEMENT MANUFACTURE

Anthony Robin Pennell, Gravesend, England, assignor to The Associated Portland Cement Manufacturers Limited, London, England

Filed Jan. 11, 1977, Ser. No. 758,409
Claims priority, application United Kingdom, Jan. 19, 1976, 1949/76
Int. Cl.² C04B *7/36*
U.S. Cl. 106—100 **13 Claims**

1. A process of making Portland cement employing at least one rotary kiln supplied with finely divided calcareous and argillaceous materials at one end and fired with fuel supplied at the other end with initially combustion-supporting gas which passes through the kiln; in which process waste matter other than a fuel is incinerated in a zone external to the rotary kiln to yield a gaseous incombustible product and a bottom ash product; said gaseous product from said zone is entrained in calcareous dust-bearing effluent gas from the process for a time sufficient to render such gaseous product innocuous; at least a proportion of said ash product is added to said calcareous and argillaceous materials and chemically combined therewith in the firing of said materials by means of said fuel to form Portlant cement clinker in the rotary kiln; and the resultant clinker is subsequently ground to standard Portland cement.

4,081,286

PROCESS FOR OBTAINING MINERAL CHARGES AND THEIR APPLICATION

Jacques Baudouin, Montelimar, and Jean-Pierre Caspar, Le Teil, both of France, assignors to Lafarge S.A., Paris, France

Filed Sep. 17, 1976, Ser. No. 724,168
Claims priority, application France, Sep. 18, 1975, 7528660
Int. Cl.² C09C *1/02, 1/28, 1/40*
U.S. Cl. 106—306 **12 Claims**

1. In a process for manufacturing a hydrated mineral charge from a composition selected from the group consisting of calcium aluminates, aluminous cements, and Portland cements, the steps comprising:

grinding said composition to a powder having an average fineness of from about 3,000 to about 5,000 square centimeters per gram (Blaine's specific surface);

hydrating said composition with water to form a paste at a temperature from about 10° C to about 100° C; and

adding a sufficient quantity of a liquefying surface active agent to said paste so that its viscosity after the substantial completion of said hydrating is less than about 5,000 cps;

said paste having a solids content from about 60% to about 80% by weight.

4,081,287

MANUFACTURING PROCESS OF MINERAL CHARGES, PRODUCTS OBTAINED AND THEIR APPLICATION

Jacques Baudouin, Montelimar, and Jean-Pierre Caspar, Le Teil, both of France, assignors to Lafarge S.A., Paris, France

Filed Nov. 1, 1974, Ser. No. 520,101
Int. Cl.² C09C *1/02, 1/28*
U.S. Cl. 106—306 **6 Claims**

1. In a manufacturing process for forming a hydrated chemical for use as a charge by hydrating an aluminous cement or a Portland cement, the steps comprising:

combining said cement with water to form a paste having a dry extract of from about 5 to about 70 percent by weight, said cement being in a granular or powdery state having a plurality of particles of a range of sizes such that an average degree of fineness of about 3000 cm^2 per gram is obtained, and vigorously agitating the particles of said cement in said past to accomplish the complete hydration of said cement by the water and subsequently drying said paste to obtain a powder and collecting said powder.

4,081,288
SUGAR CLARIFYING COMPOSITION

Julio C. Torres, Cali, Colombia, assignor to Fabcon International, Inc., San Francisco, Calif.

Filed Dec. 13, 1976, Ser. No. 749,844
Int. Cl.[2] C13D *3/00, 3/02;* C13F *1/02*
U.S. Cl. 127—48 12 Claims

1. In a process for the preparation of purified cane sugar including the steps of:
(1) liming by adding lime to cane sugar juice to raise the pH to above about 7;
(2) heating the cane sugar juice;
(3) separating precipitates in a clarifier to provide a clarified cane sugar juice;
(4) evaporating said cane sugar juice in one or more evaporators to obtain a concentrated syrup;
(5) agitating said concentrated syrup from the resulting foam and residue;
(6) further evaporating said purified concentrated syrup in vacuum pans to obtain at least a saturated syrup; and
(7) crystallizing sugar from said saturated syrup in crystallizing pans to obtain massecuite;
the improvement which comprises:
adding to a cane sugar solution prior to crystallization of said sugar, a composition (A) and a composition (B), wherein: A is comprised of

Ingredient	Weight Percent
$CaHPO_4 . 2H_2O$	10–100
$Al_{(1)}(SO_4)_3$	0–40
Kaolin	0–40
$Na_3PO_4 . H_2O$	0–90
Na polyacrylamide	0–5

and B is comprised of

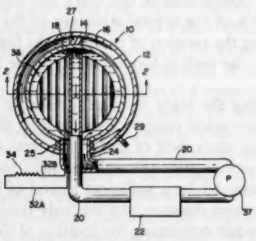
Ingredient	Weight Percent
Na_2CO_3	10–100
NaOH	0–80
CaO	0–80
MgO	0–40

wherein composition (A) is added in an amount to provide 1–500ppm and composition (B) is added in an amount to provide 2–200ppm;
and obtaining a highly purified cane sugar.

4,081,289
SOLAR ENERGY SYSTEM

William Patrick Campbell, III, 3310 Rowland Pl., Washington, D.C. 20008

Filed Dec. 24, 1975, Ser. No. 644,159
Int. Cl.[2] H01L *31/04*
U.S. Cl. 136—89 PC 8 Claims

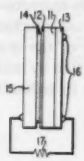


1. A system for extracting energy from the sun's rays comprising:
a pair of spaced concentric walls defining a transparent container describing a body of revolution, the space between said walls being sealed and evacuated to reduce thermal transmission thereacross;
solar cell means disposed in said container at the focal point of the body of revolution described by said container to generate an electrical current when exposed to solar radiation;
liquid means filling said container for immersing and cooling said solar cell means and for focusing said solar radiation incident on said container on said solar cell means; and
circulation means for transmitting cooled liquid to said container, for circulating liquid in said container, and for transmitting heated liquid from said container.

4,081,290
SOLAR CELLS AND PHOTOVOLTAIC DEVICES OF INP/CDS

Klaus Jurgen Bachmann, Piscataway; Ernest Buehler, Chatham; Joseph Leo Shay, Marlboro, and Sigurd Wagner, Holmdel, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Continuation-in-part of Ser. No. 522,060, Nov. 8, 1974, abandoned. This application Apr. 2, 1976, Ser. No. 672,878
Int. Cl.[2] H01L *31/06*
U.S. Cl. 136—89 TF 29 Claims



1. A photovoltaic cell comprising a region of n-type semiconductor material, a surface of which is in intimate contact with a surface of a region of p-type semiconductor material, wherein said region of n-type semiconductor material and said region of p-type semiconductor material are each in conductive contact with a respective electrode structure, said photovoltaic cell characterized in that said n-type semiconductor material is n-type CdS and said p-type semiconductor material is p-type InP, with the proviso that said n-type semiconductor material is a single crystal whenever said p-type semiconductor material is a single crystal.

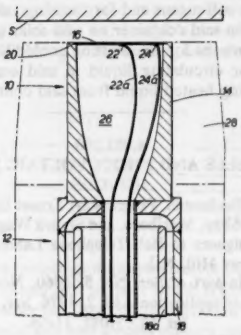
4,081,291
TEMPERATURE MEASUREMENT SENSOR

Paul Everitt English, Horsham; Ian Reginald Ashcroft, Purley, both of England, and David Robert Bosher, Nairobi, Kenya, assignors to British Steel Corporation, London, England

Continuation of Ser. No. 529,940, Dec. 12, 1974, abandoned. This application Dec. 16, 1976, Ser. No. 751,195
Claims priority, application United Kingdom, Dec. 21, 1973, 59306/73
Int. Cl.[2] H01L *35/02;* G01K *7/00*
U.S. Cl. 136—232 4 Claims

1. In a metal slab reheating furnace comprising means for supporting metal slabs during their movement through the furnace and a plurality of heat sources located within the furnace; a refractory outer covering supporting at least one temperature sensor disposed at a level below the top of the supporting means, said sensor comprising a housing having an open upper end, a single thin metal disc providing an upwardly directed radiation receiving surface located within said housing and in thermal contact therewith round the priphery of the disc, the back of said disc being insulated against heat transfer therethrough, a first thermocouple connected to said disc at substantially the geometrical center thereof, and a second thermocouple connected to said disc at a position laterally

displaced from said geometrical center and spaced inwardly from said housing, said housing providing a heat sink for heat conducted radially by said disc, there being a known and controlled heat conductive path between the centre of the disc and the housing, the arrangement being such that, in use, the radiation receiving surface of said disc is disposed in close



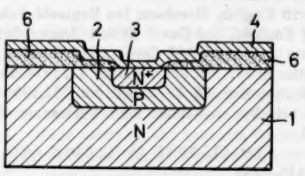
proximity to and facing the underside of a slab being heated within the furnace and the temperature measured respectively by said first and said second thermocouple may be utilized to derive a measured value of the temperature of the radiation being received from said slab by said disc, said measured value being rapidly responsive to radiantly experienced changes in temperature of the slabs.

4,081,292

METHOD OF MANUFACTURING A SEMI-INSULATING SILICON LAYER

Teruaki Aoki, Tokyo; Takeshi Matsushita, Sagamihara; Tadayoshi Mifune, Yokohama, and Motoaki Abe, Hiratsuka, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Apr. 19, 1976, Ser. No. 678,417
Claims priority, application Japan, Apr. 21, 1975, 50-48379
Int. Cl.[2] H01L *21/26*
U.S. Cl. 148—1.5 **13 Claims**



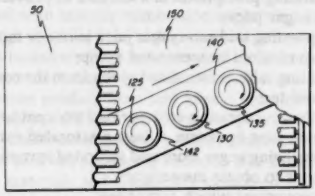
1. The method of manufacturing an element which includes forming a silicon compound layer on a silicon substrate, the silicon compound layer initially being an insulator, implanting silicon ions by a silicon ion beam into said compound layer and into a portion of said substrate on the side of its interface with said compound layer, said compound layer being converted thereby into a semi-insulating layer, said portion of said substrate being converted into an amorphous silicon portion, annealing said substrate, whereby said portion is reconverted to form a single crystal with the remaining portion of said substrate.

4,081,293

UNIFORM THERMOMIGRATION UTILIZING SAMPLE MOVEMENT

Harvey E. Cline, and Thomas R. Anthony, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 18, 1976, Ser. No. 733,238
Int. Cl.[2] H01L *21/228*
U.S. Cl. 148—1.5 **26 Claims**



1. An improved method for migrating a molten zone through a solid body of semiconductor material comprising the process steps of:

(a) selecting a body of single crystal semiconductor material having two major opposed surfaces, a predetermined type conductivity, a predetermined level of resistivity, a preferred diamond cubic crystal structure, a preferred planar crystal orientation for at least a first major surface, said orientation being one selected from the group consisting of (100), (110) and (111), and a first preferred crystal axis and a central axis which are each substantially perpendicular to at least the first major surface and substantially parallel with each other;

(b) depositing a layer of a metal of a predetermined thickness and having a predetermined geometrical configuration on the first major surface having the preferred planar orientation;

(c) supporting the body on a support;

(d) rotating the body about its own central axis;

(e) heating the body and the deposited metal to a predetermined elevated temperature with a heat source, said elevated temperature being sufficient to form a melt of a metal-rich semiconductor material on the first major surface of the body while continuing the rotation of the body, said heat source comprises a parallel array of lamps and the body is translated in a plane parallel to that of said array of lamps at an angle of between 30° and 60° to the central axes of said lamps;

(f) establishing a temperature gradient substantially parallel with the central axis of the body and the first preferred crystal axis of the crystal structure of the material while continuing the rotation of the body, the first major surface on which the melt is formed being at the lower temperature;

(g) translating the body through a distance heated by said heat source while continuously rotating the body, and

(h) migrating each melt of metal-rich semiconductor material as a molten zone through the solid body of semiconductor material for a sufficient period of time to reach a predetermined distance into the body from the first major surface, while continuing the rotation of the body, to form in situ at least one region of recrystallized semiconductor material of the body having solid solubility of the deposited metal therein, a substantially uniform cross-sectional area and a substantially uniform level of resistivity throughout the entire region.

4,081,294

AVOIDING TYPE A LUDER LINES IN FORMING SHEET MADE OF AN Al-Mg ALLOY

David S. Thompson; John S. Prestley, Jr., and Grant E. Spangler, all of Richmond, Va., assignors to Reynolds Metals Company, Richmond, Va.

Continuation of Ser. No. 527,412, Nov. 26, 1974, abandoned. This application May 26, 1976, Ser. No. 689,972.
Int. Cl.[2] C22F 1/04
U.S. Cl. 148—11.5 A 13 Claims

13. The method for making a sheet metal product that is substantially free from Type A Luder lines, which comprises: hot rolling an aluminum base alloy down to an intermediate reroll gauge of about 1/10 to 1/4 inch, the alloy consisting essentially of about 3% to 6% magnesium, zinc in a percentage amount of at least about 2% but not exceeding the percentage amount of magnesium, and a balance of aluminum, cold rolling the hot rolled alloy to form sheet having a finished thickness of about 1/32 to 1/16 inch, the cold rolling being carried out without intermediate thermal treatment, annealing the cold rolled sheet, and straining the annealed sheet to form the sheet metal product, with at least a portion of the annealed sheet being strained about 0.25% to 3%.

4,081,295

FABRICATING PROCESS FOR HIGH STRENGTH, LOW DUCTILITY NICKEL BASE ALLOYS

Eric S. Vogel, Manchester, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Jun. 2, 1977, Ser. No. 802,926
Int. Cl.[2] B22F 5/04
U.S. Cl. 148—11.5 N 10 Claims

1. A method for fabricating shaped articles from high strength, low ductility nickel base alloys, comprising:

(a) hot isostatically pressing the alloy in prealloyed powdered form to provide a substantially homogeneous, solid billet, said pressed billet exhibiting high strength and low ductility;

(b) isothermally forging the pressed alloy billet in hot dies at a temperature below but within 350° F of the normal recrystallization temperature of the alloy in a single forging pass which includes:

(1) an initial slow strain rate stage including initially forging the pressed alloy billet at a slow strain rate to produce at least a 10% reduction in thickness and effect in situ recrystallization and refinement of the billet grain structure for placing the billet in a temporary condition of low strength and high ductility, the strain rate being selected in relation to the forging temperature such that the rate is sufficiently slow to prevent cracking of the alloy billet during said initial reduction; and

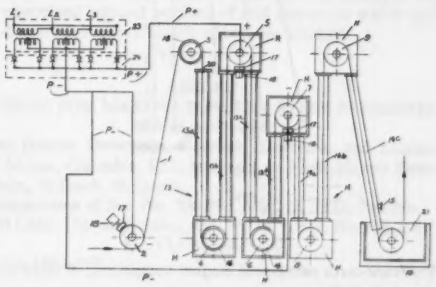
(2) a high strain rate stage following the initial reduction including continued forging of the billet at an increased strain rate to produce a major reduction in thickness to the final desired shape while the billet is in said temporary condition, the strain rate employed being higher than that used in the initial reduction stage to assure development of desirable mechanical properties in the heat treated article.

4,081,296

DIRECT-CURRENT ELECTRICAL HEAT-TREATMENT OF CONTINUOUS METAL SHEETS IN A PROTECTIVE ATMOSPHERE

Vladimir Janatka, Woodbury, and James J. Dolan, Southport, both of Conn., assignors to ValJim Corporation, Bridgeport, Conn.

Continuation-in-part of Ser. No. 401,031, Sep. 26, 1973, abandoned, which is a division of Ser. No. 342,818, Mar. 19, 1973, Pat. No. 3,792,684. This application Jul. 3, 1975, Ser. No. 592,916
Int. Cl.[2] C21D 1/74
U.S. Cl. 148—16 6 Claims



1. The method of electrically heat-treating a continuous travelling band of sheet metal of substantial width relative to its thickness as it passes through a protective atmosphere in a confining chamber for the latter and the band, with minimum energy loss, which comprises

(a) conducting the band continuously in zig-zag paths, at a predetermined speed, from a source of supply at the inlet and over a plurality of spaced guide rollers towards the outlet,

(b) applying direct-current potentials to at least some of said rollers of electrically conductive metal, and thereby to successive passes of the band, to generate resistive heating therein to the exclusion of any other extraneous heating within said chamber,

(c) reducing the length of the successive passes from the inlet to the outlet end of the travelling band to compensate for the increase in the electrical resistivity of the band with the increase in temperature thereof in the course of its travel, thereby to equalize the Joule effect in the successive passes,

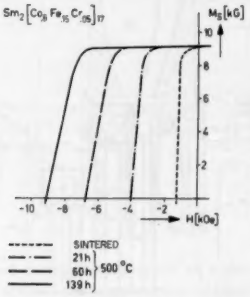
(d) restricting the quantum of the ambient atmosphere adjacent to said travelling band by confining the travel of said band through metallic housings of elongate and reduced cross-section corresponding to the large width and small thickness of the travelling band, by disposing the walls of said housings in close proximity to the opposite faces and edges of the travelling band, thereby maximizing the temperature of the said housings and atmosphere therein, solely by the radiant heat emanating from the travelling band of metal, without any heating effects resulting from inductive currents in the housing walls and consequent waste of electrical energy, and

(e) conditioning the ambient atmosphere in contact with the travelling band by introducing a gaseous agent into said housings adjacent to the outlet for exhaust adjacent to the inlet, thereby effecting gas flow in counter-current relation relative to the travel of the band of sheet metal therethrough.

4,081,297
RE-CO-FE-TRANSITION METAL PERMANENT MAGNET AND METHOD OF MAKING IT

Hartmut Nagel, Wettingen, and Roger Perkins, Oberrohrdorf, both of Switzerland, assignors to BBC Brown Boveri & Company Limited, Baden, Switzerland

Filed Sep. 10, 1976, Ser. No. 722,121
Claims priority, application Switzerland, Sep. 9, 1975, 12318/75
Int. Cl.² H01F *1/02*
U.S. Cl. 148—103 **10 Claims**



1. A rare earth permanent magnet comprising an alloy consisting essentially of:

$$RE_2(Co_{1-x-y}Fe_xTM_y)_{17+z}$$

wherein:
RE is at least one rare earth element;
TM is at least one transition element selected from the group consisting of chromium, manganese, titanium, tungsten and molybdenum;
$-2 \leqq z \leqq 1$;
$0.5 < (1-x-y) < 1$
$0.1 \leqq x \leqq 0.225$
$0.025 \leqq y \leqq 0.1$
wherein said rare earth permanent magnet is further characterized by possessing high values of coercive field strength, an ideal demagnetization curve and a remanence of more than 9KG and wherein said rare earth permanent magnet is prepared by the process which comprises mixing together a starting alloy of the composition $RE_2(Co_{1-x-y}Fe_xTM_y)_{17+z}$ and 8 to 14 wt.% of a samarium-rich sinter additive compound composed of 50–60 wt.% samarium and 40–50 wt.% of an alloy $Co_{1-x-y}Fe_xTM_y$ wherein both said starting alloy and said sinter additive are each in powder form of average grain size 2.0 to 10μm; magnetically aligning the mix; compressing it to a greenling; sintering it to form a magnet; and subjecting said magnet to a heat treatment to 400° C – 600° C.

4,081,298
HEAT TREATMENT OF IRON-NICKEL-PHOSPHORUS-BORON GLASSY METAL ALLOYS

Lewis Isaac Mendelsohn, Morristown; Kevin James Durand, New Providence, and Ethan Allen Nesbitt, Beach Haven, all of N.J., assignors to Allied Chemical Corporation, Morris Township, N.J.

Filed Sep. 7, 1976, Ser. No. 721,007
Int. Cl.² H01F *1/00*
U.S. Cl. 148—121 **8 Claims**

1. A process for increasing induction, decreasing coercivity and increasing permeability of a substantially glassy metal alloy consisting essentially of about 38 to 42 atom percent iron, about 38 to 42 atom percent nickel, and about 12 to 16 atom percent phosphorus and about 4 to 8 atom percent boron comprising:
a. immersing at least one toroidally wound filament of said alloy in a heat-transfer liquid heated to a temperature of between about 310° and 350° C, said liquid being (1) thermally stable to at least 350° C (2) nonferromagnetic, (3) electrically inert and (4) substantially unreactive with said alloy;
b. maintaining said temperature between about 310° and 350° C for about ¼ to 8 hrs, depending on the temperature selected; and
c. cooling said filament to about 25° C at a rate not greater than about 30° C/min through its Curie temperature.

4,081,299
AQUEOUS EXPLOSIVE SLURRIE WITH INORGANIC PEROXIDE SENSITIZER

George L. Griffith, Coopersburg, Pa., assignor to IMC Chemical Group, Inc., Terre Haute, Ind.

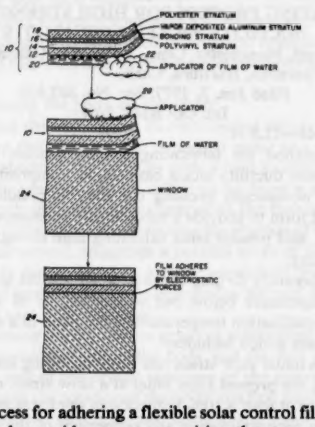
Filed Feb. 14, 1977, Ser. No. 768,237
Int. Cl.² C06B *33/14*
U.S. Cl. 149—41 **4 Claims**

1. An improved explosive slurry of the type containing an oxidizing salt, an organic fuel, a metallic fuel, a thickening agent, and water, wherein the improvement consists essentially of a sensitizing amount of an inorganic peroxide.

4,081,300
SOLAR CONTROL FILM FOR USE BY CONSUMERS AND THE LIKE

Michael E. Willdorf, Malden, Mass., assignor to Material Distributors Corporation, Woburn, Mass.

Division of Ser. No. 380,485, Jul. 18, 1973, Pat. No. 3,949,134.
This application Dec. 24, 1975, Ser. No. 644,196
Int. Cl.² E04F *13/00*
U.S. Cl. 156—71 **9 Claims**



1. A process for adhering a flexible solar control film sheet to a glass window, said process comprising the steps of:
(1) superposing on said window a solar control film having:
(a) a polyester self-supporting stratum ranging in thickness from ½ mil to 6 mils, said polyester self-supporting stratum being optically clear and transparent to visible light;
(b) a polyvinyl self-supporting stratum ranging in thickness from ½ to 6 mils, said polyvinyl self-supporting stratum being optically clear and transparent to visible light;
(c) an inner bonding stratum between the adjacent faces of said polyester self-supporting stratum and said polyvinyl self-supporting stratum, said inner bonding stratum being composed of a polymer selected from the class

consisting of polyester acrylic esters, and polyurethanes;

(d) a vapor deposited aluminum stratum on the face of said self-supporting polyester stratum, said vapor deposited aluminum stratum having a thickness of no more than 300 angstrom units and a visible light transmission ranging from 5% to 60%; and

(e) the outer face of said polyvinyl self-supporting stratum, having an electrostatic charge by which it serves as a bonding stratum;

(f) said polyester self-supporting stratum, said polyvinyl self-supporting stratum, said inner bonding stratum, and said vapor deposited aluminum stratum being moisture permeable;

(g) at least one of said polyester stratum and said polyvinyl stratum containing an ultraviolet light absorbing material effective in the range of 200 to 380 nanometers;

(h) said inner bonding stratum ranging in thickness from 0.0001 to 0.0003 inch; and

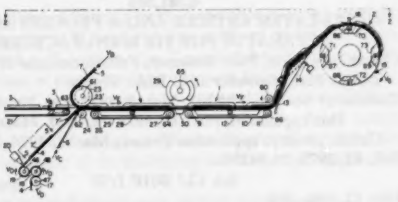
(2) causing said outer face of said polyvinyl self-supporting stratum to adhere directly to said window without an adhesive stratum interposed between said polyvinyl self-supporting stratum and said window.

4,081,301

METHOD AND APPARATUS FOR CONTINUOUSLY ATTACHING DISCRETE, STRETCHED ELASTIC STRANDS TO PREDETERMINED ISOLATED PORTIONS OF DISPOSABLE ABOSRBENT PRODUCTS

Kenneth B. Buell, Forest Park, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Oct. 30, 1975, Ser. No. 627,405
Int. Cl.[2] A61F *13/16*; B32B *31/08*
U.S. Cl. 156—164 **27 Claims**



13. A method of intermittently attaching a pair of elastic ribbons intermediate the opposed waistband portions of the absorbent pad elements contained in a continuously moving, substantially inelastic web of interconnected disposable diapers to form a pair of discrete elasticized legbands in each of said diapers cut from said web, the waistband portions of said diapers being non-elasticized to provide improved wearer comfort and fit as well as to facilitate securement thereof about the wearer's waist, said method comprising the steps of:

(a) feeding a pair of elastic ribbons to an assembly station in a stretched condition;

(b) applying adhesive intermittently on said stretched elastic ribbons at predetermined intervals along the length of said ribbons while said stretched elastic ribbons are being fed to said assembly station;

(c) feeding first and second webs of substantially inelastic material to said assembly station;

(d) feeding absorbent pad elements having opposed waistband portions intermediate said first and said second webs;

(e) adhering said stretched elastic ribbons to at least one of said webs at discrete locations intermediate the opposed waistband portions of said absorbent pad elements at said assembly station in those discrete areas of the ribbons that have adhesive applied thereto;

(f) applying bands to adhesive to at least one of said webs while said webs are being fed to said assembly station, said bands being registered such that they will ultimately lie outside the area occupied by said stretched elastic ribbons;

(g) adhering said second web, said absorbent pad elements and said first web in superposed relation at said assembly station in the areas of said bands of adhesive;

(h) maintaining said elastic ribbons in a stretched condition at least until said adhesive on said ribbons sets up;

(i) cutting said webs transversely into discrete disposable diapers along a line severing said elastic ribbons in a portion of their length which is not adhered to either of said webs; and

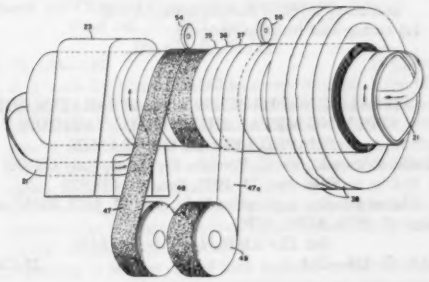
(j) allowing the severed, unadhered ends of said elastic ribbons to relax and contract to their unstretched length, whereby said unadhered ends do not impart an elasticized character to the waistband portions of said disposable diapers nor do they interfere with the functioning of the elasticized legband portions of said diapers to which said discrete lengths of elastic ribbon are adhered.

4,081,302

METHOD FOR MAKING TUBULAR RESIN ELEMENTS SUCH AS PIPES

Frede Hilmar Drostholm, Vedbaek, Denmark, and Leonard S. Meyer, Columbia, S.C., assignors to Frede Hilmar Drostholm, Vedbaek, Denmark

Continuation of Ser. No. 236,892, Mar. 22, 1972, Pat. No. 4,011,354. This application Jun. 21, 1976, Ser. No. 698,298
Int. Cl.[2] B65H *81/00*
U.S. Cl. 156—190 **14 Claims**



1. In the manufacture of tubular fiber reinforced resin elements, the method which comprises applying a tube lining to an axially moving mandrel surface to be advanced axially of the mandrel by said moving surface, applying at least one layer of fiber reinforced thermosetting resin material superimposed upon the tube lining to be advanced axially with the lining, the lining layer being applied by helically winding a preformed thermoplastic tape on the mandrel with the adjacent edges of the helical turns sealed to each other, the thermoplastic tape having a fibrous material adhered to the outer side thereof to provide fibrous interlocking with the thermosetting resin subsequently applied, and curing the thermosetting resin material to effect solidification thereof during axial advancement of the superimposed resin layers with the moving mandrel surface.

4,081,303

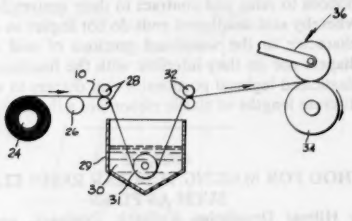
PIPE LINER LAMINATE AND METHOD OF MAKING A PIPE WITH SAID LINER

Philip A. Rogers, Denison, Tex., and John F. Herr, Larkspur, Colo., assignors to Johns-Manville Corporation, Denver, Colo.

Division of Ser. No. 347,607, Apr. 3, 1973, abandoned. This application May 24, 1976, Ser. No. 689,698
Int. Cl.[2] B32B *1/08*; B31C *13/00*
U.S. Cl. 156—192 **3 Claims**

1. A method of making a pipe having a body portion and an inner protective liner, said method comprising:

(a) forming a corrosion resistant and flexible laminate strip which is longer than it is wide, said strip including:
(i) a central layer of solid polyolefin homopolymer polymerized from an olefin monomer having 2 to 3 carbon atoms,
(ii) an innermost layer of fibrous material bonded to one side of said central layer, and
(iii) an outermost layer of fibrous material bonded to the opposite side of said central layer;
(b) at least partially saturating said innermost and outermost layers with a resinous bonding substance in liquid state;



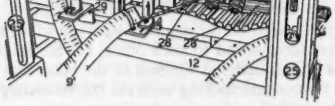
(c) winding said laminate strip around a mandrel so as to completely cover a predetermined portion of said mandrel, said strip being wound so that it defines a helical path and includes overlapping longitudinal edges having said bonding substance therebetween;
(d) forming the body portion of said pipe around said flexible laminate and in contact with said resinous substance in said outer layer of fibrous material, and
(e) curing said resinous material.

4,081,304

METALLIZING PROCESS AND APPARATUS FOR APPLYING METAL SHEET ONTO VARIOUSLY SHAPED LEDGES OR FRAMES

Duilio Bruseschi, Via C. Percoto, 19, Udine, Italy (33100)

Filed Apr. 21, 1976, Ser. No. 678,920
Claims priority, application Italy, Apr. 21, 1975, 83357 A/75; Jan. 12, 1976, 83306 A/76
Int. Cl.² B32B *31/20, 1/10, 13/10*
U.S. Cl. 156—212 **21 Claims**



1. A metallizing process for covering ledges having a transverse cross-section including areas of substantial curvature, and more particularly including at least one concavity of substantial curvature, and a substantially constant shape in the longitudinal direction, comprising:
preparing for metallization the surface to be metallized, said surface being the surface of a ledge having a transverse cross-section including areas of substantial curvature, and more particularly including at least one concavity of substantial curvature, and a substantially constant shape in the longitudinal direction;
determining the locations of a plurality of longitudinally extending subdivisions of the surface of a transverse cross-section of the ledge, wherein each of said subdivisions encompasses a straight or slightly curved tract of the surface of the transverse cross-section of the ledge, and the lines of longitudinal intersection of adjacent subdivisions are disposed at least at the center of each area of substantial curvature of the surface of the transverse cross-section of the ledge including the center of each said concavity of substantial curvature; and
applying a plurality of metallizing tapes in the longitudinal direction of the ledge, the number of said tapes being equal to the number of subdivisions, the point of application of each of said tapes being juxtaposed longitudinally along the ledge, wherein each pair of adjacent tapes are slightly overlapping.

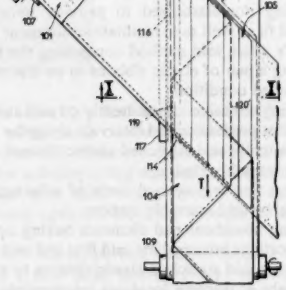
9. An apparatus for metallizing ledges having a transverse cross-section including areas of substantial curvature, and more particularly including at least one concavity of substantial curvature, and a substantially constant shape in the longitudinal direction, comprising:
a plurality of application means, each for applying a metallizing tape in the longitudinal direction of a ledge having a transverse cross-section including areas of substantial curvature, and more particularly including at least one concavity of substantial curvature, and a substantially constant shape in the longitudinal direction, said application means being disposed about the periphery of the ledge, longitudinally offset from one another, such that the strip of tape applied by each, when viewed along the surface of a transverse cross-section of the ledge, encompasses a straight or slightly curved tract of the surface of the transverse cross-section of the ledge, and the longitudinal intersection of adjacent strips of tape are slightly overlapping and disposed at least at the center of each area of substantial curvature on the surface of the transverse cross-section of the ledge including the center of each said concavity of substantial curvature.

4,081,305

MULTI-LAYER ARTICLE AND A PROCESS AND AN APPARATUS FOR ITS MANUFACTURE

Claude Guy Patin, Pont-Audemer, France, assignor to Compagnie des Etablissements de la Risle, France

Division of Ser. No. 554,707, Mar. 3, 1975, Pat. No. 4,043,855.
This application Nov. 22, 1976, Ser. No. 744,097
Claims priority, application France, Mar. 1, 1974, 74 06985; Feb. 12, 1975, 75 04295
Int. Cl.² B31F *1/00*
U.S. Cl. 156—204 **6 Claims**



1. A process for continuously manufacturing an article which has at least two thicknesses of pliable and thin material, effected by folding a single continuous strip or web of said material, wherein said strip or web is folded on itself regularly,

concertina-fashion, thereby forming alternate loops in zig-zag formation, said process comprising providing continuously the strip on the lower face of a belt, in a plane substantially parallel to the upper face of a supporting and transferring band for the formed loops, and in an angular direction relatively to the transfer direction, and applying alternately said strip to the lower face of the belt and to the upper face of the transfer band, by detaching it from said belt, in a zone where said belt is disposed over said transfer band.

4,081,306

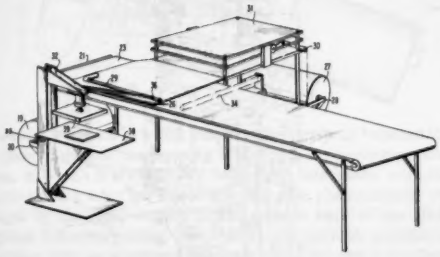
METHOD OF MAKING SURGICAL DRAPES

Donald R. DePriest; Bobby C. Brandon, and Connell M. Buie, all of Columbus, Miss., assignors to Humboldt Products Corporation, Columbus, Miss.

Continuation of Ser. No. 549,892, Feb. 14, 1975, abandoned, Ser. No. 362,451, May 21, 1973, Pat. No. 3,892,617. This application Feb. 9, 1977, Ser. No. 767,003

Int. Cl.² A61F *13/00;* **B32B** *31/00*

U.S. Cl. 156—250 **5 Claims**



1. A method of forming large, disposable complex speciality drapes having a T configuration with an abdominal cover section and a T section, the T section having at least two fenestrations at predetermined distances from one end thereof, the abdominal cover section having a predetermined width and the T section having a predetermined length, the T section affixed to the abdominal cover section a predetermined distance from an end of the abdominal cover section, said method comprising:

a. supplying abdominal cover section stock material to a first abdominal cover section work station;

b. supplying T section stock material to a first T section work station;

c. producing at least two fenestrations in the T section stock material positioned at said first T section work station;

d. supplying T section stock material having at least two fenestrations therein from said first T section work station to a second T section work station at which the fenestrated T section stock material overlies abdominal cover section stock material positioned at the first abdominal cover section work station;

e. cutting T sections from T section stock material at said second T section work station;

f. affixing cut T sections at said second T section work station to abdominal cover section stock material at said first abdominal cover section work station;

g. supplying abdominal cover section stock material having T sections affixed thereto from said first abdominal cover section work station to a second abdominal cover section work station;

h. cutting completed large, disposable complex speciality drapes from abdominal cover section stock material having a T section affixed thereto at said second abdominal cover section work station; and

i. affixing a filter to at least one of the fenestrations at one of said work stations.

4,081,307

PROCESS FOR BINDING BRAKE LININGS

Thomas E. Morgan, Jr., Bloomfield Hills, Mich., assignor to Leonard Friedman, Beverly Hills, Calif.

Continuation-in-part of Ser. No. 662,725, Mar. 1, 1976, abandoned. This application Jul. 29, 1977, Ser. No. 820,375

Int. Cl.² B29C *19/02;* **B65C** *9/25*

U.S. Cl. 156—272 **5 Claims**

1. A method of bonding brake linings to a metallic brake shoe which comprises:

(a) subjecting the inner side of the brake linings to intense preheat in a range of 500° to 700° F. for a period of 45 to 75 seconds to remove moisture and trapped gases in a thin layer at the heated surface,

(b) cooling the linings to about ambient temperature,

(c) spraying a heat-setting bonding material on the inner side of said linings,

(d) applying said inner side of a said linings to a metallic brake table surface under pressure to pre-stick the linings in place,

(e) applying a high pressure to said linings relative to said table surface in the range of 2000 pounds per square inch, and

(f) heating said linings and brake tables to a temperature in the neighborhood of 650° F. for about 45 minutes to set the heat-setting bonding material.

4,081,308

RAPID CURING TWO PART ADHESIVES

Martin M. Skoultchi, Somerset, N.J., assignor to National Starch and Chemical Corporation, Bridgewater, N.J.

Filed Jul. 27, 1977, Ser. No. 819,570

Int. Cl.² B32B *7/00*

U.S. Cl. 156—310 **14 Claims**

1. A process for bonding surfaces comprising the steps of:

(1) applying to at least one of such surfaces an adhesive base (a) comprising an acrylic monomer and a saccharin component comprising the copper salt of saccharin or saccharin and a soluble copper salt or mixture thereof, said saccharin component being present in an amount of 0.05 to 10% by weight of the monomer and said copper being present in an amount of at least 50 parts per million based on the weight of the monomer;

(2) applying to at least one of such surfaces an activator (b) comprising an alpha-hydroxy sulfone or an alphaamino sulfone; and

(3) placing the surfaces so treated in abutting relation until the adhesive composition polymerizes and bonds the surfaces together.

4,081,309

METHOD OF MAKING A COMPOSITE LABEL WEB

William A. Jenkins, Englewood, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Division of Ser. No. 607,317, Aug. 25, 1975, which is a continuation-in-part of Ser. No. 475,728, Jun. 3, 1974, Pat. No. 3,948,172, and Ser. No. 475,730, Jun. 3, 1974, Pat. No. 3,941,289, which is a division of Ser. No. 366,919, Jun. 4, 1973, abandoned, which is a division of Ser. No. 206,061, Dec. 8, 1971, Pat. No. 3,783,083, which is a continuation-in-part of Ser. No. 155,740, Jun. 23, 1971, abandoned. This application Aug. 19, 1976, Ser. No. 715,812

The portion of the term of this patent subsequent to Dec. 3, 1991, has been disclaimed.

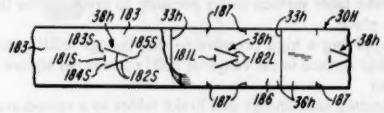
Int. Cl.² B32B *3/16, 31/18*

U.S. Cl. 156—250 **30 Claims**

1. Method of making a composite web for use in a label dispensing apparatus, comprising the steps of: providing a composite web comprising a web of supporting material and labels releasably secured to the supporting material web longitudinally along the supporting material web, cutting the supporting material web at longitudinally spaced-apart locations

to form flap portions extending initially in the plane of the supporting material web but which are capable of being folded out of the plane of supporting material web about respective fold lines, and cutting the supporting material web at the fold lines without completely separating the flap portions from the supporting material web to provide respective feed edges so that the supporting material web can be advanced by a toothed driver engaging the supporting material web at the feed edges, the composite web being wound into a roll in a direction that each feed edge is in a leading position with respect to the outer free end of the composite web and the respective flap portion is in a trailing position.

30. Method of making a composite web roll for use in a label dispensing apparatus having a toothed driver and a label separating peel edge, comprising the steps of: providing a composite label web having an elongated carrier web of flexible supporting material with a series of longitudinally disposed labels



on the carrier web and with pressure sensitive adhesive on the labels and releasably securing each label to the carrier web, and making a series of longitudinally spaced groups of cuts in the carrier web and located under the labels with each group of cuts including spaced converging bar cuts defining in the carrier web a flap portion attached to an overlying label by the pressure sensitive adhesive with each flap portion being integrally connected to the carrier web by a narrow frangible portion defined between closely spaced portions of the converging bar cuts, each frangible portion being sufficiently strong to maintain the flap portion in the plane of the carrier web when the carrier web is pulled around the peel edge by the toothed driver and to effect peeling the corresponding flap portion from the pressure sensitive adhesive on the overlying label, and each frangible portion being sufficiently weak to rupture in response to engagement of the corresponding flap portion by the toothed driver.

4,081,310

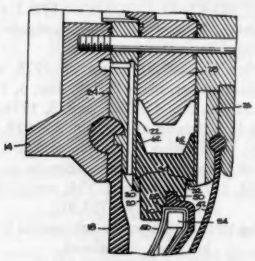
BEAD GRIP RING

Daniel Shichman, Trumbull, Conn.; Peter E. Percarpio, N. Haledon, N.J., and Sheppard A. Black, Southbury, Conn., assignors to Uniroyal, Inc., New York, N.Y.

Filed Jun. 25, 1975, Ser. No. 590,180

Int. Cl.² B29H *17/12*

U.S. Cl. 156—398 **8 Claims**



1. In a tire building drum, a rubber, radially expansible ring for gripping the bead of a tire carcass, said ring being radially expansible in and forming an expansible chamber with a circumferential channel of the drum, said ring having an outer surface which includes a lateral planar surface and an adjacent deep groove adapted to receive one end portion of a sidewall turnup bladder, said outer surface and said one end portion being suitably shaped for holding said bead of said tire carcass, and said ring further having a pair of continuous, circumferential pressure sealing flaps, one of which extends inwardly from each side of the ring, said flaps being constructed and arranged to sealingly engage with adjacent side members of the circumferential channel, whereby the ring may be radially expanded without the use of an inflatable bladder.

4,081,311

CEMENTING MACHINE FOR EDGE FOLDING OR BINDING

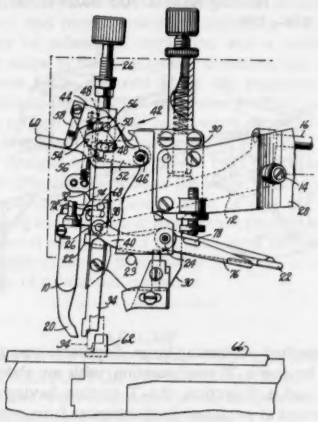
Dennis Sidney Hall, Leicester, England, assignor to USM Corporation, Boston, Mass.

Filed May 31, 1977, Ser. No. 801,758

Claims priority, application United Kingdom, Jun. 5, 1976, 23347/76

Int. Cl.² A43D *25/02*

U.S. Cl. 156—475 **7 Claims**



1. In a cementing and folding machine having a frame, a work support, a creaser foot mounted on the frame for movement into and out of operative relation with respect to a gauge block secured to the work support, and means for feeding the margin of a flexible workpiece on said support relative to the gauge block, the improvement which comprises a carrier movably mounted above the work support and adapted to interchangeably carry a binding finger or a gauge finger in and out of cooperative relation to the gauge block, mechanism for shifting the carrier to position an appropriate one of the fingers in an edge binding mode or in an edge folding mode relative to the gauge, and selector means under the control of an operator whereby the mechanism is caused to move the selected finger from the gauge either in up-and-away movement or substantially vertical movement depending on whether the edge of the work is to be folded or the work has a binding to be folded over.

4,081,312

PAPER TAPE SPLICER FOR CIGARETTE MAKERS

Athos Cristiani, Via Don Luigi Sturzo 7, Bologna, Italy

Filed Nov. 4, 1976, Ser. No. 738,922

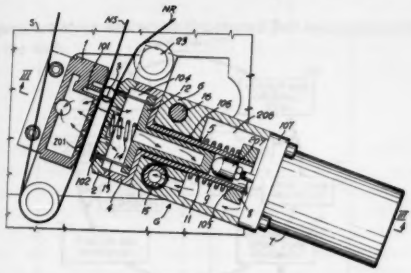
Claims priority, application Italy, Jan. 14, 1976, 12413 A/76

Int. Cl.² B65H *19/18, 19/20*

U.S. Cl. 156—504 **13 Claims**

5. Splicer for quick in-line splicings between the trailing end of an unwinding bobbin and the leading end of a stand-by bobbin, destined to reintegrate the depleted unwinding bobbin, in a continuous tape feeding unit, in particular, wrapper paper tape in cigarette making machines, characterized by the fact

that is comprises: a suction block on which the unwinding tape is guided to slide, in its path from said feeding unit to the user; a suction pressing unit, frontally facing the suction block and movable with driving means towards and against the suction block, this pressing unit having set and pneumatically held stationary on it the leading end of the stand-by tape provided with an externally applied adhesive; and a knife axially mounted free to slide whenever required, in an actuation support, integral with the pressing unit which can be moved against the suction block; this knife being in a position to be alternately moved, with driving means which are synchronized and timed with the pressing unit driving meas, between



a waiting position, in which it clears the interspace between the suction block and the pressing unit, and a cut presetting position, in which it transversely lies in that interspace, with the blade cutting edge on the unwinding tape pneumatically engaged by the fixed suction block, and the back of the blade against the reintegrating tape held by the movable pneumatic pressing unit; an accommodating slit being formed in the fixed pneumatic block, for the knife blade, which enters sideways into it, thus splitting the trailing end of the unwinding tape while the pressing unit is frontally moved against the fixed suction block, thus splicing the leading end of the stand-by tape with the trailing end of the unwinding tape, in the close proximity of the cut made by the knife.

4,081,313

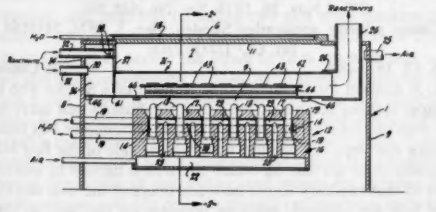
PROCESS FOR PREPARING SEMICONDUCTOR WAFERS WITH SUBSTANTIALLY NO CRYSTALLOGRAPHIC SLIP

Michael A. McNeilly; Walter C. Benzing, both of Saratoga, and Richard M. Locke, Jr., Palo Alto, all of Calif., assignors to Applied Materials, Inc., Santa Clara, Calif.

Continuation of Ser. No. 543,878, Jan. 24, 1975, abandoned, which is a division of Ser. No. 310,444, Nov. 29, 1972, abandoned, which is a continuation-in-part of Ser. No. 195,505, Nov. 3, 1971, abandoned, which is a division of Ser. No. 866,473, Oct. 15, 1969, Pat. No. 3,623,712. This application Nov. 5, 1976, Ser. No. 739,293

Int. Cl.[2] H01L *21/20, 21/324*

U.S. Cl. 156—610 **4 Claims**



1. A method for heating a plurality of substrate members formed of a single crystal material with substantially no crystallographic slip in a process for the formation of semiconductor regions by epitaxial growth, said method comprising the steps of:

placing the substrate members in intimate contact with a susceptor body on one side of the same in a cool wall reaction chamber,

heating the substrate members and the susceptor body directly and simultaneously in an unfocused, substantially uniform field of radiant heat energy produced by a bank of high intensity radiant heat lamps located on the same side of the susceptor body as the substrate members,

whereby the substrate members are heated uniformly and without appreciable thermal gradiants by a combination of direct radiation from the heat lamps and heat transfer from the susceptor body, and

introducing a gaseous reactant into the reaction chamber to effect deposition of a chemical vapor coating on the substrate members.

4,081,314

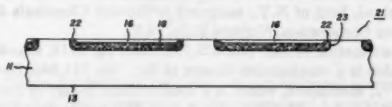
METHOD OF MAKING A SCRATCH-RESISTANT MASK FOR PHOTOLITHOGRAPHIC PROCESSING

Carlyle F. Smith, Jr., Cayuga, N.Y., assignor to General Electric Company, Auburn, N.Y.

Division of Ser. No. 669,720, Mar. 24, 1976. This application Feb. 28, 1977, Ser. No. 772,777

Int. Cl.[2] B44C *1/22;* **C03C** *15/00, 25/06*

U.S. Cl. 156—645 **14 Claims**



1. A method of making a photomask comprising the steps of

providing a glass substrate defining two smooth, substantially parallel major surfaces;

positioning a stencil on one of said major surfaces, said stencil defining openings in preselected areas;

grit etching said substrate to form depressions at said preselected areas;

depositing in said depressions, through said stencil, a fusible ceramic optical masking material;

removing said stencil; and

heating said substrate to fuse said masking material into a coherent, opaque layer bonded thereto.

4,081,315

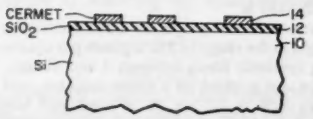
CERMET ETCH TECHNIQUE

Alan S. Templin, Hermosa Beach, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Filed May 25, 1976, Ser. No. 689,779

Int. Cl.[2] H01L *21/312;* **B44C** *1/22;* **C03C** *15/00, 25/06*

U.S. Cl. 156—653 **18 Claims**



1. The method of manufacturing thin film cermet resistance patterns, on a dielectric substrate, comprising the steps of:

(a) forming on said substrate a layer of cermet comprising primarily a resistive compound of silicon and chromium;

(b) forming a masking layer over said cermet layer so as to expose selected areas of said cermet layer; and

(c) etching away the cermet at said selected areas by subject-

ing said areas to an etchant comprising primarily phosphoric acid at a temperature of the order of 180° C.

4,081,316

METHOD FOR PRODUCING FLUFFED PULP

Sven Ulrik Torbjörn Åberg, and Sven Gunnar Bergdahl, both of Molnlycke, Sweden, assignors to Molnlycke AB, Goteborg, Sweden

Filed Dec. 1, 1975, Ser. No. 636,702
Claims priority, application Sweden, Dec. 5, 1974, 7415256
Int. Cl.[2] D21B *1/02, 1/32;* D21D *1/02;* D21F *11/14*
U.S. Cl. 162—4 4 Claims

1. A method of producing fluffed pulp for use in products for absorbing liquids, characterized in that an aqueous slurry of chemical pulp is beaten so that its drainage resistance exceeds 20° SR, 95–25% by weight mechanical wood pulp and 5–75% by weight of said chemical pulp beaten in a wet state are mixed with each other, and then the total pulp is dewatered mechanically to a dry solids content of 40–50% by weight, coarse-defibrated, dried in a flash drying step to 60–85% by weight, finish-defibrated and finish-dried to 80–95% by weight dry solids content.

4,081,317

PROCESS FOR THE REDUCTION OF EFFLUENT COLOR FROM A CELLULOSIC PULP BLEACHING SEQUENCE

Ralph J. Gall, Amherst, and Frederick H. Thompson, Grand Island, both of N.Y., assignors to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Continuation of Ser. No. 425,751, Dec. 18, 1973, abandoned, which is a continuation-in-part of Ser. No. 311,046, Nov. 30, 1972, abandoned, which is a continuation-in-part of Ser. No. 108,995, Jan. 22, 1971, abandoned. This application Sep. 11, 1975, Ser. No. 612,613
Int. Cl.[2] D21C *9/14*
U.S. Cl. 162—80 15 Claims

1. In a process for bleaching cellulosic pulp wherein cellulosic pulp is bleached in aqueous suspension with at least one member of the group consisting of chlorine and chlorine dioxide to a solubilize non-cellulosic material associated with said cellulosic pulp and wherein said pulp is thereafter subjected to extraction, the improvement comprising reducing effluent color from 50 to 90 percent by subjecting said pulp at a weight consistency of 3 to 15 percent, to said extraction by hypochlorination with about 0.5 to about 3.0 percent hypochlorite on a dry pulp weight basis, at a temperature from about 75 to about 160 degrees F., for 15–180 minutes and controlling the hypochlorination pH from about 6 to less than 9.

4,081,318

PREPARATION OF IMPREGNATED FIBERS

Popke Wietsma, Velp, Netherlands, assignor to Chemische Industrie AKU-Goodrich B.V., Arnhem, Netherlands

Filed Jul. 16, 1976, Ser. No. 706,095
Claims priority, application United Kingdom, Jul. 16, 1975, 29798/75
Int. Cl.[2] D21F *11/00*
U.S. Cl. 162—157 R 3 Claims

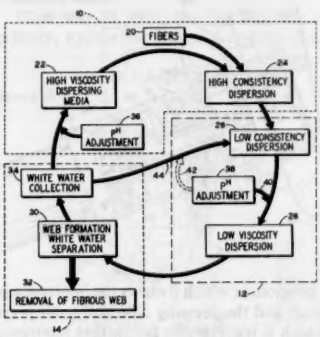
1. In a process for the preparation of a nonwoven fiber web with a weight in the range of 5 to 6 grams per square meter and comprising synthetic fibers between 4 and 45 mm. in length, made by the wet method on a paper machine, said web containing from 50% to 125 wt. % of water and being impregnated with a foamed aqueous binder composition having a density not less than 50 grams per liter while said web passes through a screening area of the paper-making machine, said aqueous binder composition being heat sensitized to coagulate in the temperature range of 25° to 95° C., drawing said layer of foamed composition into said web by means of suction applied to the underside of said web, and drying the resulting web and its content of foamed binder composition to coagulate said foamed binder composition, the improvement which comprises applying said foamed binder composition to a rotating cylindrical transfer surface disposed above the said web at a distance from the top surface of the web greater than the thickness of the layer of composition to be applied to said web.

4,081,319

CONTINUOUS PAPERMAKING PROCESS

Bernard W. Conway, Holyoke, Mass., assignor to The Dexter Corporation, Windsor Locks, Conn.

Filed Apr. 6, 1976, Ser. No. 674,152
Int. Cl.[2] D21F *1/66*
U.S. Cl. 162—168 NA 11 Claims



1. A continuous, essentially closed recirculating papermaking process comprising the steps of forming a first dispersion of fibers within a dispersion medium containing a viscosity producing agent, said agent being present at a concentration level sufficient to provide an initial high viscosity of at least 3 cps for dispersing said fibers; reducing the fiber consistency within the dispersion and at least partially chemically treating the dispersion medium to reduce the viscosity of the dispersion medium while maintaining a constant concentration level of said viscosity producing agent; subsequently forming a fibrous web on a papermaking screen from said dispersion of reduced fiber consistency and reduced viscosity while separating and collecting as white water the dispersing medium passing through said screen; at least partially chemically treating a portion of the collected white water to increase the viscosity of said white water without adding additional amounts of viscosity producing agent, continuously recirculating the white water and forming a subsequent fiber dispersion therefrom of high viscosity.

4,081,320

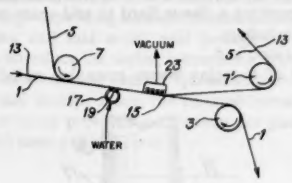
METHOD AND APPARATUS FOR SEPARATING A FIBROUS WEB FROM A FORAMINOUS BELT

Douglas Wahren, and Erik Gunnar Stenberg, both of Karlstad, Sweden, assignors to Aktiebolaget Karlstads Mekaniska Werkstad, Karlstad, Sweden

Filed Nov. 26, 1975, Ser. No. 635,398
Claims priority, application Sweden, Dec. 3, 1974, 7415154
Int. Cl.[2] D21F *2/00*
U.S. Cl. 162—205 16 Claims

1. A method for facilitating the transfer of a fibrous web in a paper-making machine from a first foraminous belt carrying the web on one side thereof to a second foraminous belt comprising the steps of applying water to the side of the first belt opposite from the side on which the web is carried to wet the web so that capillary forces between fibers of the web and the first belt are reduced, exerting pressure on the web so that adhesion between the web and the first belt is reduced, leading the second belt into engagement with the web before or after the wetting and pressure steps, and transferring the web from the first belt to the second belt by subjecting the web to a

differential pressure acting in the direction from the first belt toward the second belt after and separately from the wetting



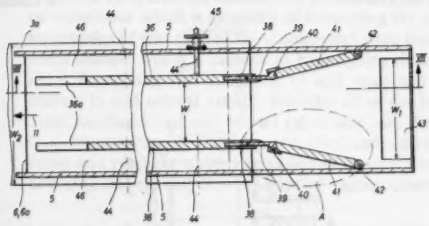
and pressure steps and while the second belt is in engagement with the web.

4,081,321

MOVABLE DECKLE WITHIN HEADBOX OUTLET

Jakob Wolf, and Iwan Lasschuit, both of Heidenheim, Germany, assignors to J. M. Voith GmbH, Heidenheim, Germany

Filed Oct. 22, 1976, Ser. No. 735,081
Claims priority, application Germany, Nov. 6, 1975, 2549726
Int. Cl.² D21F *1/02*
U.S. Cl. 162—346 **44 Claims**



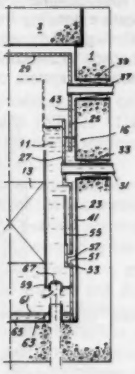
1. Apparatus for forming sheets from a dilute suspension of fibers in a liquid, comprising an endless wire having an elongated reach which moves in a predetermined direction; a head box having a suspension-discharging outlet disposed above a portion of said reach and having a predetermined length and width, as considered respectively in and transversely of said direction, said head box including two side walls flanking said outlet; a foraminous support disposed below said reach opposite said outlet to permit the liquid to flow through said wire and said support whereby at least some fibers remain on and form a mat which advances with said reach in said direction; means for regulating the effective width of said mat including a deckle extending in said direction substantially along the full length of said outlet and having a width which is a small fraction of the width of said outlet; and means for moving said deckle sideways to any one of a plurality of positions in each of which said deckle prevents the liquid from flowing through a different elongated zone of said reach, said positions including at least one position in which said deckle is spaced apart from each of said side walls.

4,081,322

DEVICE FOR THERMAL INSULATION OF A PRESTRESSED CONCRETE VESSEL WHICH AFFORDS RESISTANCE TO THE PRESSURE OF A VAPORIZABLE FLUID CONTAINED IN SAID VESSEL

Gilles Aubert, Orsay, and Guy Petit, Versailles, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Jun. 14, 1976, Ser. No. 695,424
Claims priority, application France, Jun. 19, 1975, 75 19264
Int. Cl.² G21C *9/00*
U.S. Cl. 176—37 **10 Claims**



1. A device for thermal insulation of a prestressed concrete vessel which affords resistance to the pressure of a vaporzable fluid contained within said vessel in two phases separated by an interface, at least two families of coplanar through-passages being arranged in the lower and upper portions of the pressure vessel so as to permit positioning of ducts for the admission of said fluid in the liquid state and the discharge of said fluid in the gaseous state, wherein said device comprises:

two shells disposed respectively within the lower and upper portions of said pressure vessel, the upper shell being closed by a lid, said shells which have different diameters being covered with a metallic heat-insulation and being adapted to delimit between said vaporizable fluid and the internal wall of said pressure vessel a chamber filled with fluid in liquid phase up to the level of the liquid-vapor interface of said fluid and filled with gas above said level, the arrangement of said shells in overlapping relation being such as to constitute a cold-fluid liquid seal, the lower shell being separated from the inner surface of the pressure vessel;

means whereby said shells are each supported by said pressure vessel at the level of at least three of said vessel through-passages of a given family, said means being such as to permit of radial expansion of said shells at the level of said through-passages;

leak-tight means placed at the level of the through-passages and capable of absorbing the radial expansion of said shells.

4,081,323

SUBATMOSPHERIC DOUBLE CONTAINMENT SYSTEM

Daniel Gans, Jr., Milton, and John H. Noble, Wellesley, both of Mass., assignors to Stone & Webster Engineering Corporation, Boston, Mass.

Filed Mar. 6, 1975, Ser. No. 556,170
Int. Cl.² G21C *9/00*
U.S. Cl. 176—38 **14 Claims**

1. A containment structure for a nuclear reactor or the like, including:

an outer pressure-containing shell member;

an inner pressure-containing shell member within and inwardly spaced from said outer shell member so as to create an annular space between said inner and outer containment shells;

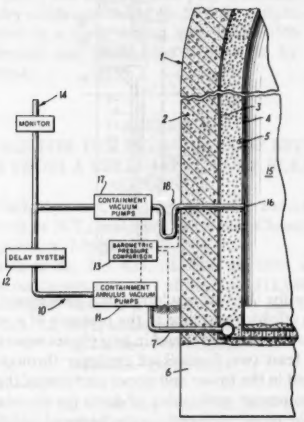
means fixedly mounting said inner and outer shell members to a base member forming a foundation for said containment structure;

first conduit means extending from outside said containment structure through said inner and outer shell members connecting the interior of said inner shell member to a first evacuation system,

said first evacuation system operating during normal operation to maintain the interior of said inner shell member normally at a subatmospheric pressure;

second conduit means extending from outside said containment structure through said outer shell member connecting said annular space to a second evacuation system,

said second evacuation system operating during normal



operation to maintain said annular space normally at a subatmospheric pressure which is intermediate that of the interior of said inner shell member and the ambient atmospheric pressure;

said inner and outer shell members containing sufficient free air volume in the interior and annular containment spaces, respectively, so that during a loss-of-coolant accident, including the maximum credible loss-of-coolant accident, resulting in the release of radioactive gases, liquids and vapors within the containment structure, the pressure of said annular space does not exceed the ambient atmospheric pressure without further operation of said first and second evacuation systems and, consequently, no outleakage of radioactive gases and vapors from the containment structure occurs and such gases and vapors remain in the containment structure after said loss-of-coolant accident without further operation of said first and second evacuation systems until such time as they may be safely vented to the atmosphere.

4,081,324

SPACER CAPTURE ROD TO SPACER GRID ATTACHMENT DEVICE

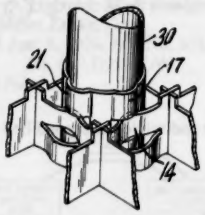
Barney S. Flora, and John F. Patterson, both of Richland, Wash., assignors to Exxon Nuclear Company Inc., Bellevue, Wash.

Filed Jun. 17, 1976, Ser. No. 696,887
Int. Cl.[2] G21C *3/30*
U.S. Cl. 176—78 **7 Claims**

1. In a nuclear fuel bundle having a parallel array of fuel rods and at least one spacer capture rod which longitudinally extend through openings formed from intersecting walls of a grid spacer, some of said walls being flat and others of said walls having protrusions extending into said openings and coacting springs for holding said fuel rods in laterally fixed positions, a spacer capture system which secures said grid spacer in fixed position comprising a sleeve fixed to said space capture rod, said sleeve including:

(a) a guide slot; and

(b) a pair of engaging bosses extending radially outward



from and mounted longitudinally apart on said sleeve for engaging one of said protrusions from said grid spacer walls between said pair of bosses such that movement of said grid space in either longitudinal direction is prevented; and

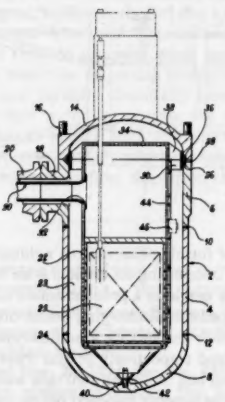
(c) a standoff boss extending radially from said sleeve and of sufficient length to be disposed in surface contact with said flat spacer grid wall.

4,081,325

INTERNAL STRUCTURE FOR A NUCLEAR REACTOR VESSEL

Roger Aubert, Orsay, and Jacques Baujat, Versailles, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Sep. 17, 1976, Ser. No. 724,261
Claims priority, application France, Oct. 2, 1975, 75 30246
Int. Cl.[2] G21C *17/08*
U.S. Cl. 176—87 **6 Claims**



1. A nuclear reactor into which testing instruments can be introduced, comprising a vertical pressure vessel having a bottom end section and a top vessel closure head with an internal lateral face therebetween, a reactor core and a core basket within said pressure vessel, said core basket having the shape of a vertical cylindrical shell having a vertical axis and provided with a btoom end wall on which the reactor core rests, the core basket further including an external lateral face and a top flange, an annular space being provided between said pressure vessel and said core basket, said core basket being fitted with a cylindrical bearing ring which surrounds said top

flange and has the same axis as the core basket, radial struts joining said ring to said top flange, said ring resting on an annular shoulder formed in the internal lateral face of said vessel, passageways being formed between said top flange, said bearing ring and said struts, said passageways being wide enough to introduce the testing instruments, said passageways being placed above said annular space and providing a direct access to said annular space, the external lateral face of said core basket being provided with means for guiding and displacing said testing instruments.

4,081,326

A METHOD FOR REMOVING MALTOTETRAOSE AND LOWER SACCHARIDES FROM SOLUTION

Leo M. Hall, Homewood, Ala., assignor to The Board of Trustees of the University of Alabama, Birmingham, Ala.

Filed Oct. 7, 1976, Ser. No. 730,820
Int. Cl.[2] C12D *13/02*
U.S. Cl. 195—7 15 Claims

1. A method for removing oligosaccharides in the range of G_1–G_4 from a solution containing the same, which comprises:

simultaneously adding baker's yeast and the Peak II maltase enzyme characterized by hydrolyzing maltotetraose only about 1/100 as fast as maltose and maltopentaose only about 1/500 as fast as maltose derived from a strain of Saccharomyces, ATCC 20,488, to said solution;

fermenting said yeast and maltose containing solution, whereby all of said G_1–G_4 oligosaccharides are removed by hydrolysis from the solution; and

recovering said G_1–G_4 oligosaccharide free solution.

2. A method for preparing an oligosaccharide fraction containing G_5+ oligosaccharides, which comprises:

adding to a natural extract derived from a grain or tuberous plant which contains a desired G_5+ oligosaccharide fraction as well as lower order saccharides which include a maltase inhibitory amount of glucose, both a yeast which is capable of fermenting maltose and glucose in said natural extract but which is incapable of fermenting the oligosaccharides of said desired G_5+ oligosaccharide fraction and a maltase which is capable of hydrolyzing maltotetraose; fermenting said admixture of said yeast and said maltase in said natural extract, whereby all of the lower order saccharides of said extract other than said desired G_5+ oligosaccharide fraction are hydrolyzed; and separating said yeast and maltase from said admixture, thereby obtaining said desired G_5+ fraction of oligosaccharides.

4,081,327

PREPARATION OF D-FRUCTOSE

Ichiro Chibata, Suita; Tetsuya Tosa, Kyoto, and Tadashi Sato, Takatsuki, all of Japan, assignors to Tanabe Seiyaku Co., Ltd., Osaka, Japan

Filed Apr. 17, 1974, Ser. No. 461,509
Claims priority, application Japan, Apr. 25, 1973, 48-48714
The portion of the term of this patent subsequent to Feb. 12, 1991, has been disclaimed.
Int. Cl.[2] C12D *13/00;* C12K *1/00;* C07G *7/02*
U.S. Cl. 195—31 F 14 Claims

1. An immobilized glucose isomerase-producing microorganism comprising a glucose isomerase-producing microorganism tightly entrapped in the lattice of a semipermeable acryloyl polymer selected from the group consisting of homopolymer of N,N'-lower alkylene-bis-acryloylamide, bis(acryloylamidomethyl) ether or N,N'-di-acryloyl-ethyleneurea, copolymer of acryloylamide and N,N'-lower alkylene-bis-acryloylamide, copolymer of acryloylamide and bis(acryloyl amidomethyl)ether and copolymer of acryloylamide and N,N'-di-acryloyl-ethyleneurea.

4,081,328

PRODUCTION OF CELLULASE BY A THERMOPHILIC THIELAVIA TERRESTRIS

Wilfred A. Skinner, Portola Valley, Calif., and Fumitake Tokuyama, Tokyo, Japan, assignors to Stanford Research Institute, Menlo Park, Calif.

Continuation-in-part of Ser. No. 624,865, Oct. 23, 1975, abandoned. This application Sep. 8, 1976, Ser. No. 721,535
Int. Cl.[2] C12D *13/10;* C07G *7/02*
U.S. Cl. 195—62 8 Claims

1. A cellulase enzyme preparation produced by the fungus *Thielavia terrestris* (NRRL 8126), which is a water-soluble solid, precipitable by ammonium sulfate, possesses both C_1 and C_x types of enzyme activity and a high degree of stability toward heat, and exhibits optimum enzyme activity at a temperature from about 60° to about 70° C at a pH between about 5.0 and about 5.6.

2. A method for the production of a cellulase enzyme by the fungus *Thielavia terrestris* (NRRL 8126), which comprises culturing said fungus in a nutrient medium therefor and recovering the enzyme produced.

7. A method for the concentration of cellulase activity from *Thielavia terrestris* NRRL 8126 fermentations, comprising the steps of precipitating the enzyme activity from culture filtration with addition of salts, separating the resulting precipitate and either dissolving this precipitate product in a suitable buffer or converting said product to a dried preparation.

8. A process for treating an aqueous system containing *Thielavia terrestris* (NRRL 8126) cellulases as well as enzymes of an undesirable character, said process comprising the step of heating said system to elevated temperatures capable of destroying said undesirable enzymes without fully destroying the activity of the cellulases,

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4,081,329

PREPARATION OF CARRIER-BOUND MACROMOLECULAR COMPOUNDS

Dieter Jaworek, Weilheim; Karl-Heinz Botsch, Bernried; Günter Weimann; Michael Nelböck-Hochstetter, both of Tutzing, and Helmut Determann, Starnberg, all of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Germany

Continuation of Ser. No. 419,845, Nov. 28, 1973, abandoned. This application Feb. 5, 1976, Ser. No. 655,363
Claims priority, application Germany, Dec. 8, 1972, 2260184
Int. Cl.[2] C07G *7/02*
U.S. Cl. 195—63 12 Claims

1. Process for the preparation of a carrier-bound macromolecular compound comprising reacting in solution a biologically active protein A with a coupling compound B which contains at least one reactive function capable of coupling with the biologically active protein A and at least one further reactive polymerizable group, adding to the resulting coupled reaction product AB in the form of a polymerizable solution having a polymerizable system therein a partially cross-linked molecular sieve material in essentially unswollen state, in an amount which cannot be completely swollen by said polymerizable solution of AB, the degree of cross-linking of the molecular sieve being such as to exclude the biologically active protein A, drawing said polymerizable solution into said molecular sieve material during swelling thereof so that said polymerizable solution and compound B are present substantially in the interior of the molecular sieve material and the biologically active protein is present substantially on the surface of said molecular sieve material, and polymerizing the polymerizable group of the coupled product AB in said polymerizable solution in the interior of the molecular sieve material whereby a polymer body is formed substantially within said molecular sieve material and said protein is fixed substantially on the surface of said molecular sieve material and is bound to said polymer therein.

4,081,330

PRODUCTION OF A MILKCURDLING ENZYME

Marc Horisberger, Mt-Pelerin; Tomaso Sozzi, Lausanne, and Robert Poussaz, Arnex-sur-Orbe, all of Switzerland, assignors to Societe d'Assistance Technique pour Produits Nestle, S.A., La Tour-de-Peilz, Switzerland

Continuation of Ser. No. 529,029, Dec. 3, 1974, abandoned. This application Jun. 22, 1976, Ser. No. 698,534

Claims priority, application Switzerland, Dec. 19, 1974, 17760/74

Int. Cl.² C07G 7/02

U.S. Cl. 195—66 R 12 Claims

1. A process for the production of a milk-curdling enzyme comprising the steps of

treating stomach tissue obtained from poultry with an aqueous saline solution with a pH-value below 4 and an ionic force of from about 0.085 to 1.2 for a contact time of about 15 to 20 minutes;

thereafter separating out undissolved material;

readjusting the pH-value of the remaining solution to a value below 4 and/or readjusting the ionic force of the remaining solution to value of from about 1 to 1.7;

thereafter separating out any undissolved materials; and

then recovering the remaining solution containing the milk-curdling enzyme.

4,081,331

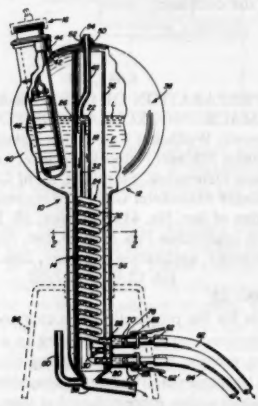
PORTABLE WATER DISTILLATION APPARATUS

Gunther Weiss, 2025 SW. Briggs Ct., Beaverton, Oreg. 97005

Filed Apr. 5, 1976, Ser. No. 673,980

Int. Cl.² B01D 5/00, 3/42

U.S. Cl. 202—181 6 Claims



1. A distillation apparatus, comprising, in combination:

(a) evaporator means for vaporizing fluid to be distilled;

(b) condenser means connected to the evaporator means for condensing vaporized fluid received from the evaporator means;

(c) heater means associated with the evaporator means for applying heat to and vaporizing fluid in the evaporator means;

(d) the condenser means being arranged extending below a surface of vaporizing liquid in the evaporator means, and including level control means for maintaining a constant level in the evaporator means of a fluid to be distilled, the condenser means further including a normally substantially vertically disposed tube having a lower fluid intake end and an upper fluid discharge end, and a substantially vertically disposed conduit extending along an axis parallel to the tube of the condenser means, the conduit having a fluid inlet end connected to the fluid discharge end of the tube and a fluid output end disposed adjacent the fluid intake end of the tube of the condenser means, with the level control means including an outlet provided in the tube for feeding fluid being carried by the tube into the evaporator means and maintaining the level of fluid in the evaporator means substantially co-planar with the upper fluid discharged end of the tube of the condenser means, and a hollow sleeve disposed about the tube and conduit, the sleeve arranged extending above the connection of the tube and conduit for receiving vaporized liquid and directing same downwardly over the conduit for condensing the vaporized liquid and forming a shell of a heat exchanger including the tube and conduit.

4,081,332

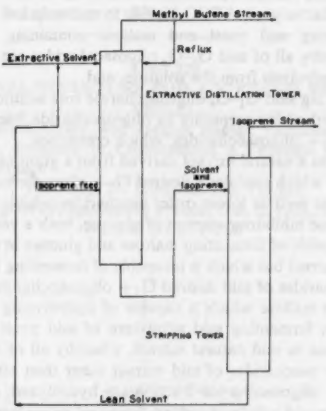
EXTRACTIVE DISTILLATION OF C_5 HYDROCARBONS USING ACETONITRILE AND ADDITIVES

Richard William Hein, Hudson, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Aug. 27, 1976, Ser. No. 718,368

Int. Cl.² B01D 3/40; C07C 7/08

U.S. Cl. 203—51 12 Claims

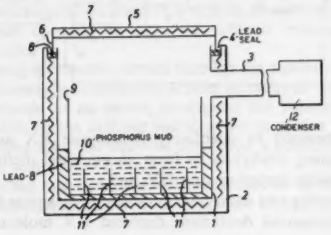


1. In an extractive distillation process for separating mixtures of C_5 hydrocarbons with different degrees of unsaturation including the steps of introducing a selective solvent to an extractive distillation column, introducing said hydrocarbon mixtures to be extractively distilled at a point below the point of introduction of said selective solvent, selectively extracting the more unsaturated hydrocarbon to form a liquid solvent fraction rich in the more unsaturated hydrocarbon, withdrawing a vaporous hydrocarbon fraction rich in the less unsaturated hydrocarbon as overhead from the top of said extractive distillation column, withdrawing the solvent rich in the more unsaturated hydrocarbon from the bottom of said extractive distillation column, passing the rich solvent with the more unsaturated hydrocarbon to a stripping column where the solvent and the more unsaturated hydrocarbon are separated, and recycling the lean solvent to said extractive distillation column, the improvement comprising employing as said selective solvent from about 67 to about 98 weight percent acetonitrile and from about 2 to about 33 weight percent of at least one additive selected from the group consisting of dimethylformamide, 3-methoxypropionitrile, ethylene glycol monomethyl ether, diethylene glycol monomethyl ether, ethylene glycol monoethyl ether and diethylene glycol monoethyl ether, said weight percents being based on dry solvent.

4,081,333
METHOD AND APPARATUS FOR DISTILLATION

William Samuel Holmes, Compton; Edward James Lowe, Stourton, nr. Stourbridge, and Ernest Reginald Brazier, Maidenhead, all of England, assignors to Albright & Wilson Limited, Warley, England

Filed Dec. 11, 1975, Ser. No. 639,694
Claims priority, application United Kingdom, Dec. 19, 1974, 55010/74
Int. Cl.² B01N 3/02
U.S. Cl. 203—86 6 Claims



1. A method for distilling phosphorus from phosphorus mud formed when entrained phosphorus-containing solids are scrubbed from the waste gases of a thermal phosphorus plant comprising

positioning phosophorus mud in an open thermally conductive vessel,

providing a distillation furnace having a heating zone and an exposed lead in the bottom of said heating zone,

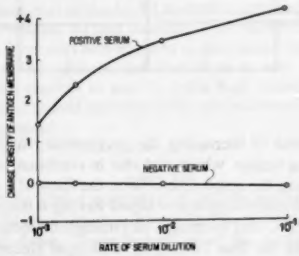
positioning said vessel in said heating zone and in direct contact with molten lead, heating said molten lead whereby said vessel and the phosphorus mud contained therein are heated to distill phosphorus from said mud as phosphorus vapour, and

recovering said phosphorus vapour from said heating zone.

4,081,334
ANTIGEN MEMBRANES FOR USE IN SYPHILIS DIAGNOSIS AND SYPHILIS DIAGNOSIS APPARATUS USING SUCH MEMBRANES

Shuichi Suzuki; Masuo Aizawa, both of Tokyo; Isao Ishigur, Kasugai; Rikio Shinohara, Kagamihara, and Yoichi Nagamura, Toyoake, all of Japan, assignors to Nippon Chemiphar Co., Ltd., Tokyo, Japan

Filed Mar. 18, 1977, Ser. No. 779,139
Claims priority, application Japan, Mar. 18, 1976, 51-29632; Mar. 18, 1976, 51-29633; Mar. 18, 1976, 51-29634; Jun. 21, 1976, 51-81408
Int. Cl.² G01N 27/46
U.S. Cl. 204—1 T 17 Claims



1. An antigen membrane for syphilis diagnosis comprising cardiolipin immobilized on a polymer matrix.

3. A method for diagnosing syphilis, comprising bringing one surface of the antigen membrane of claim 1 into contact with a solution to be tested; bringing the other surface of said antigen membrane into contact with a normal serum solution; and measuring electrochemically the membrane potential generated across said antigen membrane.

10. An apparatus for use in diagnosing syphilis comprising an electrolytic cell partitioned into two compartments by the antigen membrane of claim 1; electrodes disposed in said compartments; and a detector connected to said electrodes for measuring the membrane potential across said antigen membrane.

4,081,335
PROCESS FOR THE CONTINUOUS ELECTROLYTIC PLATING OF METAL WIRE, STRIPS, CHAINS, AND GAUZE STRIPS WITH METALS

Friedrich Von Stutterheim, Adenauerallee 7, 637 Oberursel, and Jörg Wurm, Kantstrasse 1/9, 8755 Alzenau-Kalberau, both of Germany

Filed Oct. 20, 1975, Ser. No. 624,000
Claims priority, application Germany, Oct. 23, 1974, 2450291
Int. Cl.² C25D 3/66, 7/06
U.S. Cl. 204—28 3 Claims

1. A process for electro-plating an elongate, thin article formed from a base metal with a uniform, pore-free coating of a noble metal having a thickness in the micron range comprising:

passing the article through an electrolyte bath comprising a melt of at least one salt selected from the group consisting of alkali metal cyanides, alkali metal thiocyanates, alkali metal cyanamides, alkaline earth metal cyanides, alkaline earth metal thiocyanates, alkaline earth metal cyanamides, said bath further including a salt of the noble metal to be plated, guiding the article through the bath by means of ceramic guides comprising at least one material selected from the group consisting of aluminum oxide, silicon oxide, yttrium oxide, zirconium oxide, silicon nitride, borium nitride, titanium nitride, silicon carbide, and titanium carbide, the step of passing the article through the bath being carried out in the absence of gaseous oxygen.

4,081,336
ALKALINE BRIGHT ZINC PLATING AND ADDITIVE THEREFOR

Frederick W. Eppensteiner, Southfield, and Carl Steinecker, Westland, both of Mich., assignors to The Richardson Company, Des Plaines, Ill.

Filed Apr. 7, 1977, Ser. No. 785,514
Int. Cl.² C25D 3/24, 3/26
U.S. Cl. 204—55 Y 38 Claims

1. A bright zinc, electroplating bath comprising an aqueous alkaline solution containing a source of zinc ions and a nitrogen-containing heterocyclic compound which has been alkylated with a condensate of a difunctional halohydrin and a hydroxy aryl compound in admixture with a polyethylenepolyamine formed by the reaction of ammonia and ethylene dichlorode or a quaternary salt thereof.

35. An aqueous concentrate for preparing the bath of claim 1 which concentrate includes a nitrogen-containing heterocyclic compound which has been alkylated with a condensate of a difunctional halohydrin and hydroxy aryl compound is admixture with a composition selected from the group polyethylenepolyamine and quaternary salts thereof wherein the polyethylenepolyamine has been formed by the reaction of ammonia with ethylene dichloride, the ratio of ethylene dichloride to ammonia ranging from 6:1 to 2:1.

4,081,337

ELECTROLYTIC PRODUCTION OF HYDROGEN

Robert Spitzer, 1700 Broadway, New York, N.Y. 10019

Filed Apr. 22, 1977, Ser. No. 789,999
Int. Cl.[2] C25B 1/02
U.S. Cl. 204—129 14 Claims

1. A cyclic electrolytic process of utilizing the energy of dirty carbonaceous fuels to produce commercial hydrogen which comprises:

(a) reducing an alkali sulfate to alkali sulfide by reaction of the sulfate and dirty fuel at an elevated temperature,

(b) digesting the sulfide and impurities derived from said dirty fuel with aqueous solution, or water, to dissolve the sulfide, and separate out said impurities,

(c) adding the solution of said alkali sulfide to an electrolytic cell in which an electric current is utilized to generate hydrogen at the cathode while oxidizing sulfide substantially to sulfate at the anode,

(d) separating alkali sulfate from an electrolyte stream exiting from said electrolytic cells, and

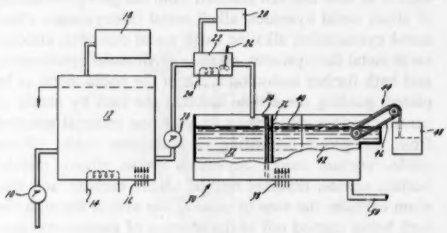
(e) recycling the alkali sulfate to the reducing procedure of said step (a).

4,081,338

METHOD OF BREAKING AN OIL-IN-WATER EMULSION

Amos Golovoy, Inkster, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 27, 1976, Ser. No. 754,923
Int. Cl.[2] C02B 1/82
U.S. Cl. 204—149 6 Claims



1. A method of breaking an oil-in-water emulsion which comprises:

adjusting the pH of the oil-in-water emulsion to a pH in the range of 6 to 10;

adding to the oil-in-water emulsion at least 1 part per million of a cation or a combination thereof selected from the group of cations consisting essentially of Fe+2, Fe+3, Al+3, Cu+1 and Cu+2;

treating the oil-in-water emulsion with a dissolvable iron electrode, said dissolvable iron electrode being dissolved by transmitting an electric current therethrough in an amount sufficient to develop an Fe+2/oil weight ratio of at least 0.02;

holding the oil-in-water emulsion treated by said dissolvable electrode until the emulsion breaks.

4,081,339

METHOD OF DEUTERIUM ISOTOPE SEPARATION AND ENRICHMENT

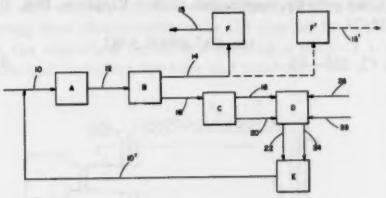
Sidney W. Benson, 533 Palos Verdes Dr. West, Palos Verdes Estates, Calif. 90274

Filed Jul. 19, 1976, Ser. No. 706,252
Int. Cl.[2] B01J 1/10; C01B 4/00
U.S. Cl. 204—158 R 31 Claims

1. A method for separating and enriching deuterium containing molecules comprising the steps of:

(a) providing a source of organic molecules containing deuterium atoms, said organic molecules having a structural formula RX, in which R is an organic radical selected from the group consisting of ethyl, isopropyl, t-butyl and 3-cyclopentenyl and in which X is selected from the group consisting of F, Cl, Br and OH;

(b) exposing said molecules to the radiation of at least one infrared laser source which has been specifically tuned



and focussed to selectively decompose RX molecules containing deuterium to form an enriched olefin specie containing deuterium and HX; and

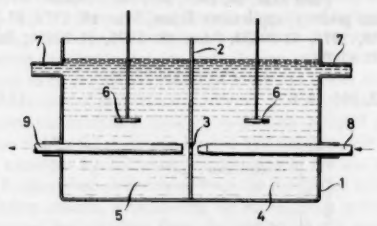
(c) separating said deuterium enriched olefin specie from the undecomposed deuterium depleted RX molecules and HX.

4,081,340

METHOD OF AND DEVICE FOR INCREASING THE PERMEABILITY OF THE SKIN OF CELLS OF LIVING BEINGS

Ulrich Zimmermann, Julich; Friedrich Riemann, Bad Salzuflen, and Günter Pilwat, Julich, all of Germany, assignors to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung

Continuation-in-part of Ser. No. 546,771, Feb. 3, 1975, abandoned. This application Jan. 25, 1977, Ser. No. 762,320
Claims priority, application Germany, Feb. 2, 1974, 2405119
Int. Cl.[2] G01N 27/00, 27/40
U.S. Cl. 204—180 R 2 Claims



1. A method of increasing the permeability of the skin of cells of living beings, which includes in combination the steps of: introducing the respective cells in the form of a suspension into an electrically conductive liquid having a temperature of from 0° to 25° C and forming a physiological electrolyte solution, exposing the thus formed physiological electrolyte solution containing said cells to an electric field of predetermined strength until macromolecules having a radius of at least 5 A are exchanged through the skin acting as diaphragm for said cells between the solution in the interior of said cells and the physiological electrolyte solution.

4,081,341
USE OF POLYMERIC QUATERNARY AMMONIUM HYDROXIDES IN ELECTRODEPOSITION

Roger M. Christenson, Gibsonia; Joseph F. Bosso, Lower Burrell; Marvis E. Hartman, Pittsburgh, and Wen-Hsuan Chang, Gibsonia, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Nov. 24, 1976, Ser. No. 744,532
Int. Cl.[2] C25D *13/10, 13/24*
U.S. Cl. 204—181 C 8 Claims

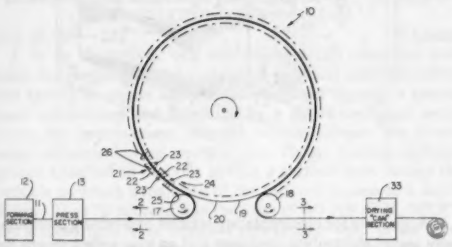
5. A process for cathodically electrodepositing a coating on a conductive article which comprises the steps of:

1. immersing the conductive article in an aqueous dispersion which contains an acidified cationic resinous coating vehicle,
2. passing an electric current through the aqueous dispersion between the conductive article as cathode and another electrode as an anode to deposit the resinous coating vehicle on the cathode and to generate acid at the anode,
3. feeding into said aqueous dispersion a polymeric quaternary ammonium hydroxide,
4. reacting said hydroxide with said acid to form the corresponding quaternary ammonium salt of said acid.

4,081,342
ELECTROSTATIC METHOD FOR TREATING MATERIAL

James T. Candor, 5440 Cynthia La., Dayton, Ohio 45429

Continuation-in-part of Ser. No. 695,068, Jun. 11, 1976, Pat. No. 4,033,841, which is a continuation-in-part of Ser. No. 569,815, Apr. 21, 1975, Pat. No. 3,966,575. This application Oct. 15, 1976, Ser. No. 732,646
Int. Cl.[2] B01D *13/02*
U.S. Cl. 204—180 R 17 Claims



1. A method of treating liquid bearing material comprising the steps of creating a plurality of non-uniform electrostatic fields in an arrangement so that each field has the higher intensity portion thereof substantially oppositely located relative to the higher intensity portion of an adjacent non-uniform field, disposing said material in said arrangement so that said non-uniform fields at least partially extend through said material to act on at least part of the liquid thereof to move at least part of said liquid relative to said material, and repetitively changing said fields from said non-uniform arrangement thereof to substantially all be uniform and then back to said non-uniform arrangement thereof to tend to pulse said movement of said liquid relative to said material while said material is disposed in said arrangement.

4,081,343
PROCESS FOR CATIONIC ELECTRODEPOSITION

Karl F. Schimmel, Verona; Percy E. Pierce, Monroeville, and James E. Jones, Lower Burrell, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 601,108, Aug. 1, 1975, Pat. No. 4,007,154. This application Nov. 3, 1976, Ser. No. 738,785
Int. Cl.[2] C25D *13/10*
U.S. Cl. 204—181 C 5 Claims

1. A method of electrocoating an electrically conductive surface serving as a cathode in an electrical circuit comprising said cathode and an anode and an aqueous electrodepositable composition wherein the electrodepositable composition comprises an aqueous dispersion of:

(A) a cationic polyamine group-containing resin which contains active hydrogens and

(B) a pigment paste comprising:

(1) an adduct comprising the reaction product of:

(a) an organic polyepoxide,

(b) an organic tertiary amine acid salt containing blocked isocyanate groups capable of unblocking at room temperature or elevated temperature to react with active hydrogens in (A), the tertiary amine acid salt reacting with and opening epoxy moieties in said organic polyepoxide to form quaternary ammonium salt groups,

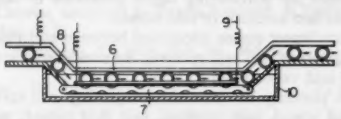
(2) a pigment dispersed therein;

wherein the pigment adduct weight ratio is at least 2:1.

4,081,344
METHOD FOR ELECTRODEPOSITION REPAIR COATING OF THE END OF AN EASY-OPEN CAN

Yoshio Shindou, and Makoto Nakamura, both of Yokohama, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Jan. 19, 1976, Ser. No. 649,977
Claims priority, application Japan, Jan. 20, 1975, 50-7847
Int. Cl.[2] C25D *13/18, 13/20*
U.S. Cl. 204—181 R 7 Claims



1. In a method for effecting repair coating of the end of an easy-open can where the metal of the end has been exposed by scoring work and where the film coating on the said end has been deteriorated including subjecting the can to a pretreatment operation for electrodeposition coating and thereafter electrodepositing a coating on said can, the improvement wherein the pretreatment for electrodeposition coating involves removing said deteriorated film coating by means of hydrogen gas formation and is effected by introducing the can into an electrodeposition coating bath as an electrode therein, impressing a sine wave alternating current voltage of about 10 volts to about 300 volts and at a frequency of about 10 Hz to about 10,000 Hz on the bath, disposing an electrode means of polarity opposite to that of said can in said bath, and controlling the ratio of the coating deposit current of normal direction to that of reverse direction in the initial electric current flow to between 1 to 0.1 and 1 to 1.

4,081,345
APPARATUS FOR DETERMINING SMALL AMOUNTS OF NITROGEN

Günter Tölg, and Wido Werner, both of Schwabisch Gmund, Germany, assignors to Max-Planck-Gesellschaft zur Föerderung der Wissenschaften e.V., Gottingen, Germany

Filed Jul. 30, 1976, Ser. No. 710,233
Claims priority, application Germany, Aug. 4, 1975, 2534773
Int. Cl.[2] G01N *27/44*
U.S. Cl. 204—195 T 2 Claims

1. Apparatus for analyzing a substance for nitrogen content comprising:

(a) a vessel adapted to hold a medium prepared by digesting said substance in a liquid medium until the nitrogen content thereof is converted to ammonium ions and alkalinizing said medium;

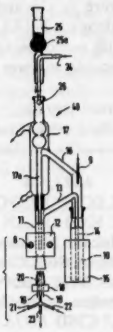
(b) first heating means for heating the contents of said vessel

to a temperature above the boiling point of water and for thereby generating vapors from said contents;

(c) a receiver adapted to hold an acidic aqueous medium;

(d) second heating means for heating the contents of said receiver to a temperature higher than the boiling point of said acidic aqueous medium and for thereby generating steam;

(e) first connecting tubing connecting said vessel to said receiver for introducing the material of said vapors into the acidic medium in said receiver;



(f) second connecting tubing connecting said receiver to said vessel for introducing steam generated in said receiver into said contents of said vessel;

(g) condenser means interposed between said first connecting tubing and said receiver for condensing said material of said vapors; and

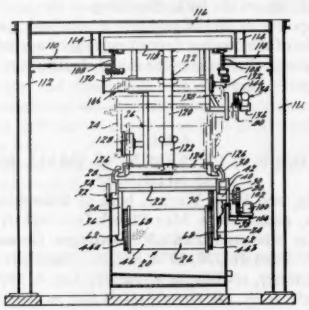
(h) a plurality of electrodes projecting into said receiver, said vessel, said receiver, said first tubing, said second tubing and said condenser means constituting a closed system sealed from the ambient atmosphere.

4,081,346

HORIZONTAL OSCILLATING TREATING BARREL APPARATUS

Denis S. Fogo, Manzini, Swaziland, and Roy W. Skaggs, Jr., Mt. Clemens, Mich., assignors to Oxy Metal Industries Corporation, Detroit, Mich.

Filed May 3, 1977, Ser. No. 793,386
Int. Cl.[2] C25D *17/20;* B01F *9/02*
U.S. Cl. 204—213 **20 Claims**



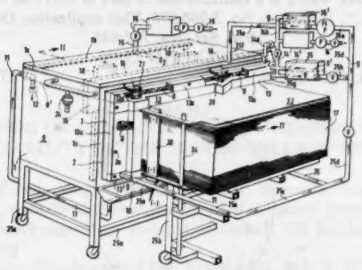
1. A work carrier for treating articles in bulk comprising a framework, a foraminous treating barrel defining a generally cylindrically-shaped internal treating chamber and formed with a longitudinally extending opening in communication with said chamber, means for rotatably mounting said barrel at its ends to said framework for rotation about a horizontal axis extending substantially longitudinally and centrally of said chamber, a ring gear on one of the ends of said barrel, a drive assembly including drive shaft means rotatably supported on said framework having driven gear means on one portion thereof disposed in meshing relationship with said ring gear and drive gear means on another portion thereof adapted to be disposed in meshing relationship with external reversible drive means to effect an oscillating movement of said barrel when disposed at a treating station, an engaging member affixed to said shaft means including engaging means thereon for engaging an external abutment when said carrier is disposed at a treating station to restrict oscillating movement of said barrel beyond a preselected angularity, and yieldable coupling means associated with said drive assembly and said reversible drive means adapted to yield when said engaging means is disposed in stopping relationship with said abutment.

4,081,347

APPARATUS FOR ELECTROPLATING METAL SURFACES, IN PARTICULAR CUT EDGES FORMED BY STACKING SHEET METAL PANELS CUT TO SIZE

Otto Alfred Becker, Robert-Koch-Str. 59, 66 Saarbruecken 6, Germany

Filed Mar. 29, 1976, Ser. No. 671,379
Claims priority, application Germany, Dec. 11, 1975, 2555800; Mar. 27, 1975, 2513885
Int. Cl.[2] C25D *17/14, 21/04, 21/10*
U.S. Cl. 204—224 R **26 Claims**



1. Apparatus for electroplating articles comprising a substantially sealed electrolyte container and an evacuating means for evacuating the space above the electrolyte surface in the electrolyte container, and anode and cathode electrodes, characterized in that the electrolyte container is subdivided by porous partition means in the upper portion of said container for maintaining anode and cathode gas spaces that separate gas extraction means are provided for said gas spaces and that electrolyte extraction, degassing and supply means are provided via which the electrolyte is extracted, degassed and return to the cathode and anode gas spaces.

4,081,348

ELECTROLYTIC CELL LINER AND SEAL DEVICE

Ralph Francis Anderson, Akron, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

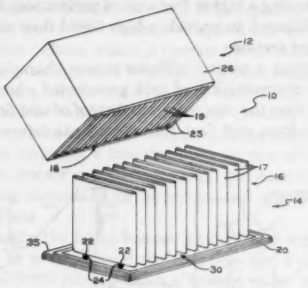
Filed Jun. 1, 1977, Ser. No. 802,221
Int. Cl.[2] C25B *9/00, 13/02*
U.S. Cl. 204—242 **5 Claims**

1. In an electrolytic cell having upper and lower separable portions, wherein said upper portion includes a cathode assembly held within a cell cover, said lower assembly includes an anode assembly connected to a base plate protected by a cell liner; and said cell liner includes an elastomeric sheet and an elastomeric sealing device disposed for contact with a lower portion of the cell cover to seal the cell, the improvement wherein said sealing device comprises

A. an elastomeric sealing channel adhered to said elasto-

meric sheet, said sealing channel having upwardly spaced projecting legs and a seat between said legs, and

B. an elastomeric extrusion of circular cross-section disposed



within said channel on said seat such that the lower portion of said upper assembly will contact said extrusion to seal the cell when the upper and lower assemblies are joined.

4,081,349

POLYAMINE MODIFIED MEMBRANES AND CHLOR-ALKALI ELECTROLYSIS CELLS EMPLOYING SAME

Charles J. Hora, Willoughby Hills, and Andrew D. Babinsky, Chagrin Falls, both of Ohio, assignors to Diamond Shamrock Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 515,166, Oct. 16, 1974, abandoned. This application Jun. 16, 1975, Ser. No. 587,047

Int. Cl.² C25B *1/16, 1/26, 13/04*

U.S. Cl. 204—252 **9 Claims**

1. In an electrolytic cell comprising a cell container with inlets for electrolyte and outlets for products and electrolyte and having an anode and cathode disposed therein in spaced apart relationship and separated by a cation-exchange membrane, the improvement wherein said membrane is a fluorinated polymer having pendent side chains bearing sulfonyl groups attached to carbons having a surface layer facing the cathode in which a majority of the sulfonyl groups to a depth of from 2½ to 10 microns is in the form of $SO_2NR\text{-}C_2H_4\text{-}NRR''$, and a subsurface layer adjacent said surface layer in the form $SO_2NRR'NRR''$ wherein R is hydrogen, sodium or potassium; R' is C_3–C_6 alkylene, $Z_2N(R'')$, or $ZN(R'')Z_2N(R'')$; Z is C_2–C_6 alkylene; and R'' is R or $—SO_2—$.

4,081,350

DIAPHRAGMS FOR USE IN THE ELECTROLYSIS OF ALKALI METAL CHLORIDES

Igor V. Kadija, and Kenneth E. Woodard, Jr., both of Cleveland, Tenn., assignors to Olin Corporation, New Haven, Conn.

Filed Oct. 29, 1976, Ser. No. 736,805

Int. Cl.² C25B *13/04, 1/34*

U.S. Cl. 204—296 **10 Claims**

1. A diaphragm for use in the electrolysis of alkali metal chloride brines which comprises a cohesive body formed of a mixture of sand and a polyarylene sulfide binding agent.

4,081,351

CONVERSION OF COAL INTO MOTOR FUEL

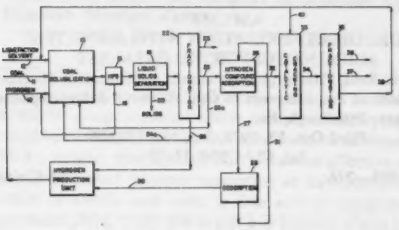
Heinz Heinemann, Princeton, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Sep. 2, 1976, Ser. No. 719,762

Int. Cl.² C10G *1/04, 1/06, 25/02, 17/02*

U.S. Cl. 208—8 **3 Claims**

1. A process for converting coal into liquid fuel which consists of the steps (1) solubilizing coal in a liquefaction solvent to form a homogeneous liquid phase, wherein said liquefaction solvent is a thermally stable polycyclic aromatic and hydroaromatic mixture which results from one or more petroleum refining operations; (2) separating the liquid phase from undissolved solids; (3) fractioning the liquid phase to provide distillate fractions; (4) subjecting the intermediate range of



distillate fractions having a boiling point in the range between about 400° and 1000° F to non-catalytic denitrification treatment to yield a denitrified synthetic crude oil having a nitrogen content of less that about 0.1 weight percent; and (5) introducing the synthetic crude oil into a catalytic cracking zone to produce motor fuel.

4,081,352

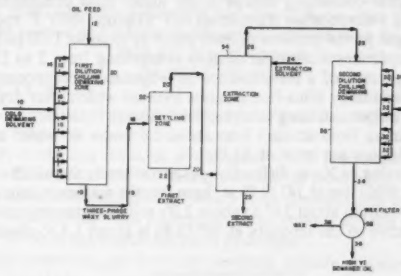
COMBINATION EXTRACTION-DEWAXING OF WAXY PETROLEUM OILS

Theodore H. West; John F. Eagen, and David A. Gudelis, all of Sarnia, Canada, assignors to Exxon Research & Engineering Co., Linden, N.J.

Filed Jun. 17, 1976, Ser. No. 696,888

Int. Cl.² C10G *43/08*

U.S. Cl. 208—36 **13 Claims**



1. A process for simultaneously extracting and dewaxing a waxy oil which comprises the sequential steps of:

(a) simultaneously introducing a cold, binary solvent and said oil into a dilution chilling zone to form a three-phase slurry comprising solid wax, a first raffinate and a first extract, the first raffinate and first extract having a wax content lower than that of the feed;

(b) passing the slurry from the dilution chilling zone to a separation zone wherein the first extract is separated from the solid wax and first raffinate;

(c) passing the solid wax and first raffinate from said separation zone to an extraction zone wherein the first raffinate is contacted with an extraction solvent, in the presence of the solid wax, to form a second raffinate and a second extract, the second extract having a wax content lower than that of the feed;

(d) separating the second extract from the second raffinate and wax;

(e) passing the wax and second raffinate from the extraction zone to a dewaxing zone and simultaneously therewith introducing dewaxing solvent into the dewaxing zone to precipitate wax from the second raffinate, the dewaxing

zone being maintained at a temperature lower than that of the dilution chilling zone;

(f) separating the wax from the second raffinate; and

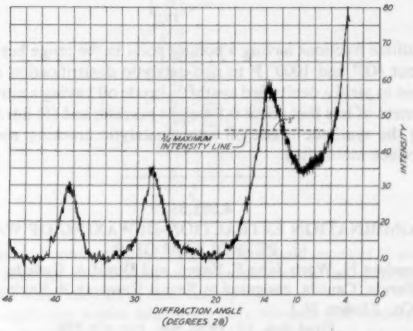
(g) recovering a lube oil stock from the dewaxed second raffinate.

4,081,353

HYDRODESULFURIZATION WITH A SPECIFIC ALUMINA-SUPPORTED CATALYST

William L. Kehl, Pittsburgh, and Angelo A. Montagna, Monroeville, both of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Oct. 15, 1976, Ser. No. 732,650
Int. Cl.[2] C10G *23/02*
U.S. Cl. 208—216 **12 Claims**



1. A hydrodesulfurization process which comprises contacting a sulfur-containing charge stock under mild conditions including a temperature from about 600° to about 1000° F. and a hydrogen partial pressure of from about 50 to about 1200 psig with a hydrodesulfurization catalyst comprising from 2 to 25 weight percent of a metalliferous hydrogenation component on a substantially silica-free alumina hydrate which after drying and before calcining comprises an alumina hydrate:

containing from about 1.2 to about 2.6 moles of water of hydration per mole of Al_2O_3;

and having an X-ray diffraction pattern wherein the width of the (020) line at 14° (2 θ) at three-fourths maximum intensity is from about 2.0° to about 2.0°; and the intensity ratio relative to the intensity at 10° (2 θ) is about 1.3 to about 5.0.

4,081,354

LIQUID-LIQUID EXTRACTION PROCESS

William J. Christman, Barrington, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 627,989, Nov. 3, 1975, Pat. No. 4,039,389. This application Oct. 29, 1976, Ser. No. 737,126
Int. Cl.[2] C10G *19/08, 27/02, 29/28;* C07C *149/12*
U.S. Cl. 208—235 **11 Claims**

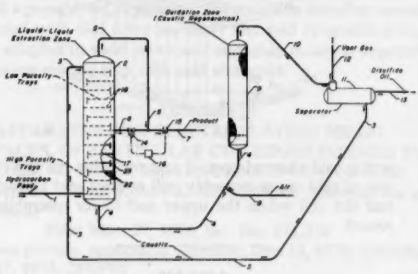
1. A continuous liquid-liquid extraction process for the separation of a preselected chemical compound from a feed stream comprising a mixture of hydrocarbons which comprises the steps of:

(a) passing a solvent stream comprising a solvent which is selective for the extraction of said preselected chemical compound into the first end of a liquid-liquid extraction zone maintained at extraction conditions for passing said solvent stream through said extraction zone;

(b) passing said feed stream into the second end of said extraction zone to flow countercurrent to the solvent stream which is passing through said extraction zone, from said first end to said second end to extract said preselected chemical compound from said feed stream to said solvent stream;

(c) removing a first raffinate stream characterized by a lower concentration of said preselected chemical compound than the concentration thereof of said feed stream from an intermediate point of said extraction zone, said first raffinate stream passing through a first section of extraction trays having a higher free area of perforation, as hereinafter delineated, to provide a high liquid flow rate through said first section;

(d) removing a second raffinate stream characterized by a lower concentration of said preselected chemical compound than the concentration thereof of said first raffinate stream from said first end of said extraction zone, said



second raffinate stream passing through a second section of extraction trays having a lower free area of perforation than the free area of perforations in said first section of step (c) to provide a lower liquid flow rate through said second section;

(e) admixing said first raffinate stream and said second raffinate stream and thereby effecting the formation of a product stream; and,

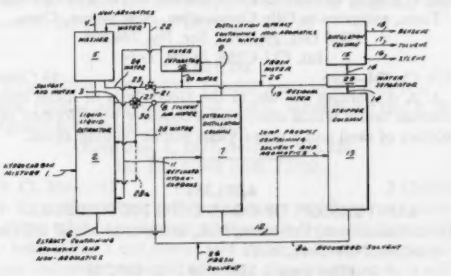
(f) removing an extract stream comprising the solvent and the preselected chemical compound from said second end of the extraction zone.

4,081,355

PROCESS FOR RECOVERING HIGHLY PURE AROMATICS FROM A MIXTURE OF AROMATICS AND NON-AROMATICS

Gerhard Preusser, Essen; Martin Schulze, Neviges; Klaus Richter, and Wilhelm Huwels, both of Essen, all of Germany, assignors to Krupp-Koppers GmbH, Essen, Germany

Continuation of Ser. No. 526,367, Nov. 22, 1974, abandoned, which is a continuation of Ser. No. 432,341, Jan. 10, 1976, abandoned, and Ser. No. 170,900, Aug. 11, 1971, abandoned. This application Oct. 27, 1976, Ser. No. 736,151
Claims priority, application Germany, Aug. 12, 1970, 2040025
Int. Cl.[2] B01D *3/40;* C10G *7/00*
U.S. Cl. 208—313 **14 Claims**



1. The process of recovering the aromatics from a feed containing a mixture of aromatic and non-aromatic hydrocarbons comprising the steps of

introducing the said feed into a liquid-liquid extractor col-

umn while introducing solvent and water into the top section of said column above the level of introduction of said feed, withdrawing non-aromatics as raffinate and withdrawing aromatics and solvent-water together with a minor amount of non-aromatics as the extract;

passing the said extract at about midpoint into an extractive distillation column which is operated so as to have both a rectifying section and a stripping section while passing solvent or a solvent-water mixture into the top section of the column, withdrawing the head product essentially consisting of non-aromatic hydrocarbons from said column and refluxing it into the lower section of the liquid-liquid extractor and withdrawing the bottom product consisting essentially of aromatics and a solvent-water mixture and

finally passing the latter bottom product into a distillation column so as to separate the aromatics and a part of the water as head product from a solvent-water mixture as bottom product, recovering the aromatics and recycling the solvent-water mixture;

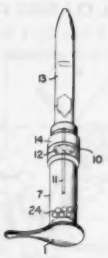
the solvent in steps and being the same and the amount of water in the solvent-water mixture passed into or formed in said liquid-liquid extractor being in excess of the corresponding water in said extractive distillation column whereby formation of a two-phase liquid system in the liquid-liquid extractor is promoted while the capacity of the solvent for the non-aromatics in said extractive distillation step is decreased.

4,081,356

FECALATOR, AN APPARATUS AND METHOD FOR CONCENTRATION OF PARASITE EGGS AND LARVAE

Willadene S. Zierdt, Rockville, Md., assignor to The United States of America as represented by the Department of Health, Education and Welfare, Washington, D.C.

Filed Sep. 24, 1976, Ser. No. 726,218
Int. Cl.[2] B03B *7/00*
U.S. Cl. 209—3 **3 Claims**



1. A method of recovering parasitic eggs and larvae from a measured sample of feces which comprises:

(a) softening and homogenizing said sample in a tube having an open end utilizing formaldehyde adding an oil-in-water surfactant with mechanical stirring agitation;

(b) closing said open end with a filter means and a separation chamber;

(c) agitating in a horizontal direction in said tube;

(d) inverting and shaking said tube vertically to filter said sample through said filter into said separation chamber and adding ether to complete the filtration to produce a formalin-ether mixture with said sample;

(e) reagitating the formalin-ether mixture and said sample; and

(f) centifuging said mixture and sample to produce three layers, namely, (1) top layer containing ether, (2) intermediate layer containing fecal solids, and (3) bottom layer containing clear fluid and packed sediment with said eggs.

4,081,357

PROCESS FOR SELECTIVE FLOCCULATION OF HEMATITIC IRON ORES IN THE PRESENCE OF NON-FERROUS MINERALS

Michael Francis Werneke, Milford, Conn., and Joseph Van Wyk, Green Bay, Wis., assignors to American Cyanamid Company, Stamford, Conn.

Filed Feb. 7, 1977, Ser. No. 766,155
Int. Cl.[2] B03D *3/06*
U.S. Cl. 209—5 **10 Claims**

1. A process for recovering iron values from a hematitic iron ore and its gauge material which comprises: slurrying a fine ground hematite ore in water at a concentration of about 5% to 20% by weight; treating said slurry with an effective amount of an acrylic acid polymer containing at least about 70 mole percent of acrylic acid units in free acid or alkali metal or ammonium (NH_4^+) salt forms and any balance of one or more mer units compatible therewith, said polymer having a viscosity as a 0.5 weight percent solution in water at pH 5.2 and 25° C. in the range of about 100 to 5,000 centipoises; settling the iron values as a underflow concentrate; and recovering the iron concentrate.

4,081,358

PROCESS FOR THE LIQUEFACTION OF COAL AND SEPARATION OF SOLIDS FROM THE LIQUID PRODUCT

Gim Tan, and John G. Gatsis, both of Des Plaines, Ill., assignors to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 750,480, Dec. 14, 1976, which is a continuation-in-part of Ser. No. 536,680, Dec. 26, 1974, Pat. No. 3,997,425. This application Dec. 29, 1976, Ser. No. 755,372
The portion of the term of this patent subsequent to Dec. 14, 1993, has been disclaimed.
Int. Cl.[2] C10G *1/06*
U.S. Cl. 208—8 **5 Claims**

1. A process for producing hydrocarbonaceous liquid products from coal which comprises the steps of:

(a) contacting the coal, at a temperature of from about 150° C. to about 450° C. and a pressure of from about 10 to about 300 atmospheres with a hydrogenated coal oil solvent having been hydrogenated to remove at least about 80% of the asphaltenes and hydrogen;

(b) separating gas from the resultant mixture to provide a liquid phase comprising coal extract, a partially spent coal oil solvent and finely divided solid particles;

(c) supplying said liquid phase, including substantially all of said partially spent coal oil solvent, to a pre-mix zone and therein commingling the same with from about 10 weight percent to about 1000 weight percent of a light aromatic solvent selected from the group consisting of benzene, toluene and xylene at a temperature of from about 10° C. to about 150° C., a pressure of from about atmospheric to about 25 atmospheres and a weight ratio of unreacted coal oil solvent to light aromatic solvent of from about 0.1 to about 1000;

(d) introducing the mixture from the pre-mix zone to a separation zone and therein separating a solid ash from the admixed liquids;

(e) thereafter removing said light aromatic solvent from said admixed liquids in a solvent recovery zone;

(f) removing an ash-free hydrocarbon stream from said solvent recovery zone and hydrogenating at least a portion thereof to form a hydrogenated coal oil with at least 80% of the asphaltenes removed therefrom; and

(g) supplying at least a portion of said hydrogenated coal oil to step (a) as said asphaltene-free hydrogenated coal oil solvent.

4,081,359

PROCESS FOR THE LIQUEFACTION OF COAL AND SEPARATION OF SOLIDS FROM THE LIQUID PRODUCT

John G. Gatsis, and Gim Tan, both of Des Plaines, Ill., assignors to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 536,680, Dec. 26, 1974, Pat. No. 3,997,425. This application Dec. 14, 1976, Ser. No. 750,483 The portion of the term of this patent subsequent to Dec. 14, 1993, has been disclaimed.

Int. Cl.[2] C10G *1/06*

U.S. Cl. 208—8 **5 Claims**

1. A process for producing hydrocarbonaceous liquid products from coal which comprises the steps of:

(a) contacting the coal, at a temperature of from about 150° C. to about 450° C. and a pressure of from about 10 to about 300 atmospheres with a hydrogenated coal oil solvent having been hydrogenated to remove at least about 80% of the asphaltenes and having a hydrogen to carbon ratio of from about 1.2 to about 1.4, and hydrogen;

(b) separating gas from the resultant mixture to provide a liquid phase comprising coal extract, liquefaction zone effluent solvent and finely divided solid particles;

(c) supplying said liquid phase, including substantially all of said coal oil solvent, to a pre-mix zone and therein commingling the same with from about 10 weight percent to about 1000 weight percent of a light aromatic solvent selected from the group consisting of benzene, toluene and xylene at a temperature of from about 10° C. to about 150° C. and a pressure of from about atmospheric to about 25 atmospheres;

(d) introducing the mixture from the pre-mix zone to a separation zone and therein separating a solid ash from the admixed liquids;

(e) thereafter removing said light aromatic solvent from said admixed liquids in a solvent recovery zone;

(f) removing an ash-free hydrocarbon stream from said solvent recovery zone and hydrogenating at least a portion thereof to form a hydrogenated coal oil solvent having been hydrogenated to remove at least about 80% of the asphaltenes and having a hydrogen to carbon ratio of from about 1.2 to about 1.4, and

(g) supplying at least a portion of said hydrogenated coal oil solvent to step (a) as said hydrogenated coal oil solvent.

4,081,360

METHOD FOR SUPPRESSING ASPHALTENE FORMATION DURING COAL LIQUEFACTION AND SEPARATION OF SOLIDS FROM THE LIQUID PRODUCT

Gim Tan, and John G. Gatsis, both of Des Plaines, Ill., assignors to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 750,480, Dec. 14, 1976, which is a continuation-in-part of Ser. No. 536,680, Dec. 26, 1974, Pat. No. 3,997,425. This application Dec. 29, 1976, Ser. No. 755,374

Int. Cl.[2] C10G *1/06*

U.S. Cl. 208—8 **4 Claims**

1. A method for suppressing asphaltene formation during coal liquefaction which comprises the steps of:

(a) contacting the coal at a temperature of from about 150° C. to about 450° C. and a pressure of from about 10 to about 300 atmospheres with hydrogen and a hydrogenated coal oil solvent having been hydrogenated to remove at least about 80% of the asphaltenes and containing a small amount, up to 3 wt. %, of benzene soluble asphaltenes;

(b) separating gas from the resultant mixture to provide a liquid phase comprising coal extract, liquefaction zone effluent solvent and finely divided particles;

(c) commingling said liquid phase with from about 10 wt. % to about 1000 wt. % of a light aromatic solvent selected from the group consisting of benzene, toluene and xylene at a temperature of from about 10° C. to about 150° C. and a pressure of from about atmospheric to about 25 atmospheres;

(d) separating solids and light aromatic solvent from the resultant liquid mixture;

(e) hydrogenating at least a portion of the remaining liquid mixture to remove at least about 80 percent of the asphaltenes; and

(f) supplying resultant hydrogenated liquid to step (a) as said coal oil solvent.

4,081,361

PROCESS FOR THE CONVERSION OF CARBONACEOUS MATERIALS

Richard E. Hildebrand, Glenshaw; Angelo A. Montagna, Monroeville, and John A. Paraskos, Pittsburgh, all of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Jul. 26, 1976, Ser. No. 708,290

Int. Cl.[2] C10G *1/08*

U.S. Cl. 208—10 **9 Claims**

1. A process for converting a solid carbonaceous material to a liquid product which comprises heating a slurry composed of said solid carbonaceous material and a solvent having hydrogen-transfer properties together with hydrogen in the presence of a substantially phosphate-free catalyst comprising Group VI and Group VIII metals, their oxides or sulfides, with the atomic ratio of said Group VIII metal to said Group VI metal being about 1:0.3 to about 1:5, supported on a non-zeolitic carrier, which catalyst is promoted with about one to about ten weight per cent titanium, at a temperature of about 260° to about 480° C. and a pressure of about 500 to about 10,000 pounds per square inch absolute.

4,081,362

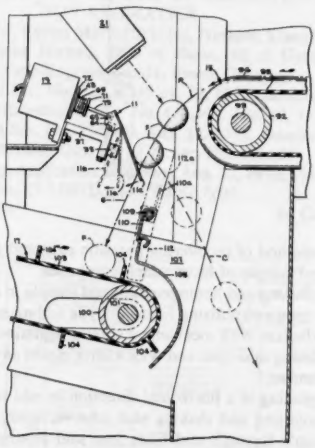
APPARATUS FOR MECHANICALLY SORTING FRUIT

Donald W. Chamberlin, Los Gatos, and Donald W. Irving, San Jose, both of Calif., assignors to FMC Corporation, San Jose, Calif.

Filed Jul. 22, 1976, Ser. No. 707,744

Int. Cl.[2] B65G *47/34*

U.S. Cl. 209—74 R **10 Claims**



1. In a fruit sorter having a conveyor for carrying fruit and for discharging fruit from the end of said conveyor with a good-fruit location being provided adjacent the end of said conveyor so that fruit discharged from the end of said conveyor falls toward said good-fruit location, apparatus for rejecting cull fruit or non-fruit and for accepting good fruit, said apparatus comprising:

a paddle, said paddle being mounted on said fruit sorter adjacent to said good-fruit location;

means for scanning a fruit moving past the end of the conveyor in a viewing area to determine color characteristics of said fruit and for making a decision based upon such color characteristics as to whether said fruit is a good fruit or a cull fruit;

means connected to said last named means for generating a continuous reject signal at all times during the operation of said sorter in the absence of a good fruit within said viewing area;

power-actuated means for positioning said paddle in a reject position in the path of fruit discharged from the end of said conveyor in response to said reject signal to thereby deflect all cull fruit or non-fruit from said good-fruit location; and

spring return means for moving said paddle from said reject position in the absence of a reject signal, said spring return means thereby allowing good fruit to move past said paddle into said good-fruit location.

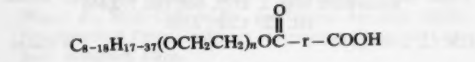
4,081,363

MINERAL BENEFICIATION BY FROTH FLOTATION: USE OF ALCOHOL ETHOXYLATE PARTIAL ESTERS OF POLYCARBOXYLIC ACIDS

Martin Grayson, Cos Cob, Conn., assignor to American Cyanamid Company, Stamford, Conn.

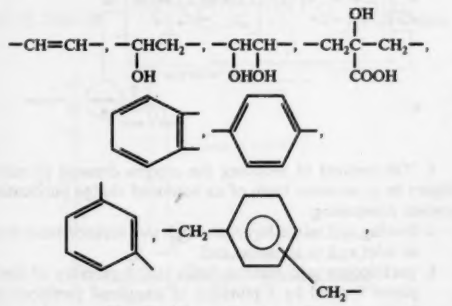
Filed May 29, 1975, Ser. No. 582,040
Int. Cl.² B03D *1/02*
U.S. Cl. 209—166 **10 Claims**

1. A process for recovering non-sulfide minerals which comprises classifying the mineral to provide particles of flotation size, slurrying the sized mineral in aqueous medium, conditioning the slurry with effective amounts of fuel oil, alkali, and a partial ester of a polycarboxylic acid having at least one free carboxylic acid group, and floating the desired mineral values by froth flotation, said partial ester having the structure.



$$C_{8-18}H_{17-37}(OCH_2CH_2)_nOC-r-COOH$$

wherein n is an integer of 1-10 and R is a bivalent grouping selected from $-(CH_2)_m$ wherein *m* is an integer of 1 to 6.



o, p, and m- and $-C_6H_{10}$-.

4,081,364

FROTH FLOTATION METHOD FOR STIBNITE

Vuko M. Lepetic, Iselin, N.J., assignor to Engelhard Minerals & Chemicals Corporation, Menlo Park, N.J.

Continuation-in-part of Ser. No. 608,110, Aug. 2, 1977, abandoned. This application Jul. 8, 1976, Ser. No. 703,513
Int. Cl.² B03D *1/02*
U.S. Cl. 209—167 **5 Claims**

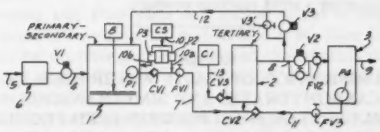
1. A froth flotation process for recovering stibnite from an ore, ore concentrate or ore preconcentrate containing iron sulfide minerals using acidic, recirculated or mine water containing sulfate salts of heavy metals and alkaline earth metals to form the flotation pulp, said water not having undergone conventional water treatment intended to render the water neutral and to remove metal salts, which comprises carrying out the flotation at the natural pH of the pulp, said pH being about 6 or below, in the presence of a lead salt activator and a xanthate collector for the stibnite and a previously formed alkaline water-soluble zinc-cyanide complex salt reagent as a depressant for iron sulfide minerals.

4,081,365

METHODS FOR USE IN WATER PURIFICATION PARTICULARLY SEWAGE TREATMENTS

Eugene B. White, Oak Park, and Mahindar N. Sharma, Lake Zurich, both of Ill., assignors to Filters International Inc., Chicago, Ill.

Filed Jan. 2, 1974, Ser. No. 429,488
Int. Cl.² C02B *1/20, 1/34;* C02C *1/02, 5/04*
U.S. Cl. 210—3 **97 Claims**



1. A method for use in the continuous, automatic cyclic treatment of sewage and waste materials, particularly those containing in excess of 25 p.p.m. BOD and in excess of 25 p.p.m. total solids, in which the accumulation of sewage in a main body is time dependent with periods of maximum and minimum average accumulation occurring in relatively uniform repetitious time sequence, comprising the steps of effecting in such main body a biological-chemical oxidation of such sewage by aerating sewage accumulating therein during periods of said maximum accumulation, followed by a setting in said main body during an initial portion of said period of minimum accumulation, introducing a prereacted floc in the effluent of said main body, prior to the end of such period of biological-chemical oxidation, to produce a substantially instantaneous floc-agglomeration with the effluent maintained at a pH favorable to such floc-agglomeration, and with the zeta potential of the effluent being stabilized at from −5 to +5 ZP, and thereafter during said period of minimum accumulation sequentially removing effluent from said main body, sequentially introducing in the removed effluent additional prereacted floc to produce a further substantially instantaneous floc-agglomeration, filtering out of said effluent previously and subsequently formed agglomerate containing suspended solids and colloidal particles, and thereafter removing by adsorption, dissolved organic solids contained in said filtered effluent, and effecting, between periods of effluent removal from the main body, an oxidation and removal of the separated and adsorbed materials derived from said filtration and adsorption steps.

4,081,366
PROCESS FOR DEWATERING ORGANIC WASTE PRODUCT

James M. O'Donnell, Woonsocket, R.I., assignor to Orgonics, Inc., Slatersville, R.I.

Continuation of Ser. No. 568,867, Apr. 17, 1975, Pat. No. 3,976,465, which is a continuation-in-part of Ser. No. 196,765, Nov. 8, 1971, abandoned. This application Aug. 18, 1976, Ser. No. 715,439

The portion of the term of this patent subsequent to Mar. 9, 1993, has been disclaimed.

Int. Cl.[2] C05F 3/00

U.S. Cl. 210—10 18 Claims

18. A process for dewatering a solid reaction material derived from a sewage sludge, which process comprises:

a. prereacting a urea-formaldehyde solution to form an aqueous solution under alkaline pH conditions of water-soluble, monomeric mono and dimethylol ureas and an excess of urea;

b. adding the prereacted urea-formaldehyde solution to undigested or waste-activated sewage sludge material in an aqueous solution, and reacting the waste material in the solution under alkaline pH conditions of from about 7.0 to 9.0 with the water-soluble, monomeric, methylol ureas in the presence of the excess of urea;

c. thereafter condensing the methylol ureas by adding an inorganic acid or acid salt to establish an acid pH condition of from about 3.0 to 5.0 in the solution, and to form a solid, water-insoluble reaction product, which product comprises a solid polyurea condensate having methylene bridges, a molecular weight of less than 800 and composed essentially of a linear-type, low-molecular-weight condensate and solid organic waste material;

d. adding an alkaline material to the solution containing the solid product and in an amount sufficient to neutralize the solution containing the solid product; and, thereafter,

e. filtering the solid reaction product from the solution and recovering a solid reaction product.

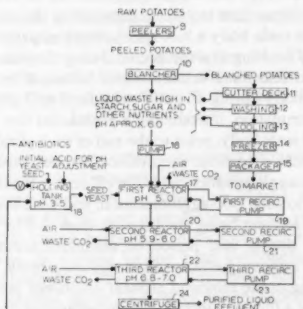
4,081,367
PURIFICATION OF WASTE WATER HIGH IN CARBOHYDRATES AND SIMULTANEOUS PRODUCTION OF HIGH PROTEIN FEED PRODUCT

John Robin Hulls, Mill Valley, and David Michael Donofrio, Stinson Beach, both of Calif., assignors to Bio-Kinetics Inc., San Rafael, Calif.

Filed Jan. 24, 1977, Ser. No. 761,765

Int. Cl.[2] C02C 5/10

U.S. Cl. 210—11 4 Claims



1. A method for purifying waste water that is high in carbohydrates including starch while obtaining therefrom a high-protein feed product, comprising the steps of:

inoculating said waste water at a pH of approximately 6, with yeast inoculant that converts starch, sugar and nutrients to more yeast, and in an amount sufficient to so convert substantially all the starch, sugar and yeast consumable nutrients in said waste water, said inoculant being at a pH such that a mixture of waste water and inoculant is adjusted to approximately 5,

growing said inoculated yeast in said waste water while the pH in said water-inoculant mixture increases gradually from an initial value of approximately 5, toward neutrality as a by-product of the growth of the yeast without addition of further materials,

circulating and recirculating the inoculated water with air in an amount that enhances the growth rate, and venting waste CO_2 to atmosphere,

separating out purified liquid waste from moist solids, at the time when the pH is about 7,

harvesting a large proportion of moist solids, while selecting a smaller proportion for recycle,

sending said smaller proportion to a treatment zone,

treating it there with at least one antibiotic and lowering the pH there to about 3.5, by addition of acid, both to suppress a substantial portion of bacterial growth while the yeast grows, and then, after a suitable treatment time,

recycling the treated material to said inoculating step as the inoculant yeast.

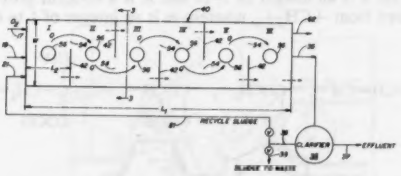
4,081,368
ACTIVATED SLUDGE SYSTEM WITH STAGGERED PARTITION BASIN

Charles S. Block, Allentown; Michael S. Chen, Macungie; Olaf J. Noichl, Whitehall, and Sun-nan Hong, Macungie, all of Pa., assignors to Air Products & Chemicals, Inc., Allentown, Pa.

Division of Ser. No. 616,459, Sep. 24, 1975, abandoned. This application Mar. 2, 1977, Ser. No. 773,468

Int. Cl.[2] C02C 1/06

U.S. Cl. 210—14 6 Claims



1. The method of reducing the oxygen demand of mixed liquor in an aeration basin of an activated sludge purification system comprising:

a. flowing said mixed liquor through said aeration basin from an inlet end to an outlet end,

b. partitioning said aeration basin into a plurality of liquid passes formed by a plurality of staggered partitions extending partially across the width of said basin and extending throughout the depth of the mixed liquor,

c. flowing said mixed liquor through said plurality of liquid passes in a non-restricted serpentine manner by maintaining an open cross-sectional flowpath area between adjacent liquid passes within the range of 30% to 80% of the wetted cross-sectional area of said basin,

d. aerating said mixed liquor as it flows through said liquid passes with a plurality of aerators,

e. operating each of said liquid passes in a non-completely mixed mode so as to have a non-uniform oxygen demand throughout each liquid pass,

f. maintaining intra-zone and inter-zone backflow within and between each of said liquid passes,

g. maintaining the aerator mixing factor of each of said aerators within the range of 20 to 450, and

h. maintaining the effective liquid staging greater than one effective liquid stage per actual liquid pass.

4,081,369

COMMON ION EFFECT TO ASSIST LM SEPARATION

Norman N. Edison Li; Robert P. Cahn, Millburn, and Adam L. Shrier, Montclair, all of N.J., assignors to Exxon Research & Engineering Co., Linden, N.J.

Continuation-in-part of Ser. No. 404,716, Oct. 9, 1973, which is a division of Ser. No. 174,990, Aug. 25, 1971, Pat. No. 3,779,907, which is a continuation-in-part of Ser. No. 99,267, Dec. 17, 1970, Pat. No. 3,719,590, and a continuation-in-part of Ser. No. 23,094, Apr. 13, 1970, Pat. No. 3,617,546. This application Mar. 18, 1976, Ser. No. 668,128

The portion of the term of this patent subsequent to Jan. 25, 1989, has been disclaimed.

Int. Cl.[2] B01D *13/00*; C02B *1/46*

U.S. Cl. 210—22 R 10 Claims

1. In a process for removing a soluble material from solution by contacting said solution with an emulsion, the external phase of which is immiscible with said solution and permeable to said soluble material and the internal phase contains a reagent which reacts with said permeable soluble material to form an insoluble precipitate, which is trapped in said internal phase, the improvement which comprises maintaining the concentration of said reagent in the internal phase of the emulsion at a level at which the concentration of said soluble material in the internal phase of the emulsion is suppressed by means of the common ion effect to a level below the level to which it is desired to remove said soluble material from solution.

4,081,370

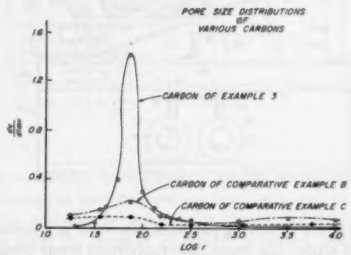
USE OF CARBON PARTICULATES WITH CONTROLLED DENSITY AS ADSORBENTS

Joseph Lawrence Schmitt, Jr., Bethel, Conn.; Philip Leroy Waker, Jr., State College, Pa., and George Augustus Castellion, Stamford, Conn., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 688,508, May 20, 1976, Pat. No. 4,029,600, and a continuation-in-part of Ser. No. 559,933, Mar. 19, 1975, abandoned. This application Feb. 22, 1977, Ser. No. 770,875

Int. Cl.[2] B01D *15/00*

U.S. Cl. 210—39 3 Claims


PORE SIZE DISTRIBUTIONS OF VARIOUS CARBONS
CARBON OF EXAMPLE 3
CARBON OF COMPARATIVE EXAMPLE B
CARBON OF COMPARATIVE EXAMPLE C
LOG r

1. A process for adsorbing adsorbable materials from solution which comprises contacting said solution with a porous carbon particulate comprising carbon black spheres bonded in molded relationship by a carbonized binder, said spheres having an average diameter in the range of about 80 to 5000 angstrom units and a surface area of at least 100 square meters per gram, and said particulate having a pore volume of at least 0.2 cubic centimeters per gram, a surface area of at least 100 square meters per gram, said particulate surface area being equal to or less than the surface area of said spheres, and a pore size distribution such that at least about 45% of its total surface area is in pores of radius equal to or greater than 20 angstrom units.

4,081,371

FILTERING OF MOLTEN METAL

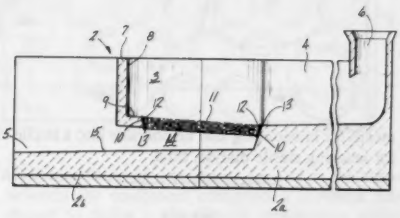
John C. Yarwood, Madison, Conn.; James E. Dore, Ballwin, Mo., and Robert K. Preuss, Middleton, Conn., assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Division of Ser. No. 597,963, Jul. 21, 1975, Pat. No. 4,024,056. This application Sep. 30, 1976, Ser. No. 727,903

The portion of the term of this patent subsequent to May 24, 1994, has been disclaimed.

Int. Cl.[2] B01C *23/02*

U.S. Cl. 210—69 6 Claims



1. In the filtration of molten metal with a removable filter plate, the method which comprises:

providing a filter chamber having a floor, a metal inlet and a metal outlet and having a wall surface adapted to be partitioned by a filter plate;

providing a filter plate for filtration of molten metal having an open cell structure characterized by a plurality of interconnected voids, said plate having a peripheral surface adapted to mate with the wall surface of the filter chamber and including a resilient sealing means on said peripheral filter plate surface resistant to said molten metal;

inserting said filter plate and sealing means in said filter chamber to engage the wall surface of the filter chamber so that the filter plate is substantially horizontally disposed at an angle of from 1° to 5° upwardly sloped towards said metal outlet; and

thereafter passing molten metal through said filter plate for discharge through said outlet, wherein the surface of the filter plate is maintained below the level of the molten metal and wherein the floor of the filter chamber beneath the filter plate is sloped downwardly towards said metal outlet.

4,081,372

LEAKAGE INDICATOR FOR RECIRCULATING PERITONEAL DIALYSIS SYSTEM

Curtis Lyman Atkin, and Robert Longfield Stephen, both of Salt Lake City, Utah, assignors to University of Utah, Salt Lake City, Utah

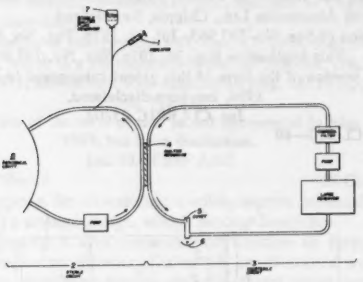
Filed Dec. 8, 1975, Ser. No. 638,729

Int. Cl.[2] B01D *31/00*

U.S. Cl. 210—94 11 Claims

5. In a recirculating peritoneal dialysis system having one or more sterile fluid circuits, one or more nonsterile fluid circuits and appropriate interfaces therebetween, an apparatus for the detection of dialysis membrane leakage, comprising:

a. a source of hemolysate or other hemoglobin based leakage indicator having strong coloration characteristics, and



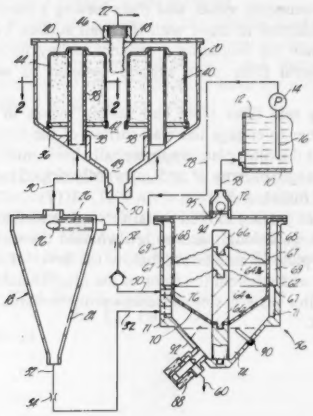
b. means for introducing said hemolysate into a sterile circuit for marking sterile dialysis fluid.

4,081,373

MECHANISM FOR EXHAUSTING IMPURITIES FROM ENGINE FUEL

Edward J. Rozniecki, St. Clair Shores, Mich., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 26, 1977, Ser. No. 800,665
Int. Cl.² B01D *39/20*
U.S. Cl. 210—114 **8 Claims**



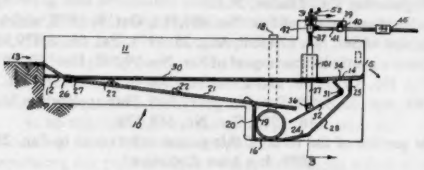
1. In an engine fuel impurity purge system comprising a liquid fuel tank: the combination comprising a conical cyclone and water coalescer means arranged in series flow relation between the tank and engine for removing solids impurity and water impurity from the fuel; each of said cyclone and water coalescer means having outlet means for discharging fuel-impurity underflow; an additional separator mechanism for returning the discharged fuel to the tank while simultaneously exhausting the impurity out of the system; said additional separator mechanism comprising a number of vertically-spaced hydrophobic screens, a settling chamber directly below the the hydrophobic screens, means for introducing fuel-impurity underflows from said outlet means of the cyclone and the water coalescer means into an entrance zone between the screens and settling chamber, fuel take-off means above the screens whereby fuel-impurity is caused to flow upwardly through the screens to reach the take-off means, a fuel return line adapted to convey purified fuel from the take-off means to the tank, and valve means controlling gravitational flow of impurity out of the settling chamber.

4,081,374

BALANCE CONTROL WATER SCREEN

Edward Forshee, 3171-309 Rd., Grand Valley, Colo. 81635

Filed Sep. 28, 1977, Ser. No. 837,545
Int. Cl.² B01D *29/42*
U.S. Cl. 210—116 **1 Claim**



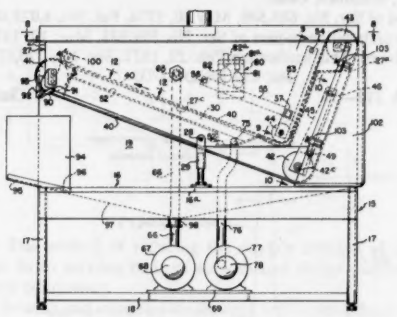
1. An improved balance control water screen wherein the improvement comprises a pair of shrouds each of which are disposed on the inner faces of opposed vertical walls, screw members riding within said shrouds, said screw members being provided with flange members at their top extent to retard vertical displacement at any desired point, said screw members are connected to a door remote from said flanges and said door is pivotally disposed about a rod which is mounted through water retarding bearings on said vertical walls.

4,081,375

FILTER BELT CONSTRUCTION

Douglas O. Deal, and Michael E. Miller, both of Bellevue, Ohio, assignors to Sam Stein Associates, Inc., Sandusky, Ohio

Continuation of Ser. No. 659,483, Feb. 19, 1976, abandoned.
This application Apr. 29, 1977, Ser. No. 792,430
Int. Cl.² B01D *33/04*
U.S. Cl. 210—122 **7 Claims**



1. A filter for removing particles entrained in a liquid, consisting of a supporting frame, said supporting frame comprising a housing forming a reservoir having imperforate side walls and a bottom for holding a volume of sediment-holding liquid, a major portion of said bottom of said reservoir having an inclined planar opening, a single layer endless filter belt extending closely over said opening, driving means on said frame causing passage of said filter belt across said opening and then a return run back to said opening, said belt traveling outside said reservoir at ambient temperature and inside said reservoir in hot liquid, a closed suction box beneath substantially said entire opening, means for providing a vacuum in said box, a plurality of cylindrical uncrowned belt-supporting rolls rotatably mounted in spaced parallel relation on said frame, said endless filter belt mounted to pass over said rolls moving

slowly, said belt being a single layer of generally delicate metallic woven mesh between 200 microns and 60 microns square of wires as small as 0.007 inches diameter, said belt having a length between rolls about two to five times its width, means for moving and tracking said belt including a link belt endless chain outside each longitudinal side edge of said belt, each link in each of said chains rotatably supporting two parallel rollers crosswise of said filter belt, extra link means on opposite sides of said chains connecting adjacent links, a bracket member pivotally supported between adjacent links on the inside thereof, each said bracket member having a rigid flange extending at right angles over the adjacent edge of the belt, means firmly fixing said flange to said adjacent edge of said belt with the plane of said belt substantially coinciding with the plane of the rotating axes of said rollers, said filter belt being uninterrupted crosswise between said brackets on opposite sides thereof, power means for driving said chains including a drive shaft for one of said rolls and drive sprocket means on said shaft outside of said one roll, said power means driving said one roll and said sprocket means simultaneously, whereby said filter belt may track in a straight line and may bend first in one direction and then in the opposite direction if necessary, without extra strain on the belt, and a straight doctor blade may scrape collected particle material off substantially the full width of said belt.

4,081,376
EMERGENCY RUNNING APPARATUS IN A FILTERING APPARATUS

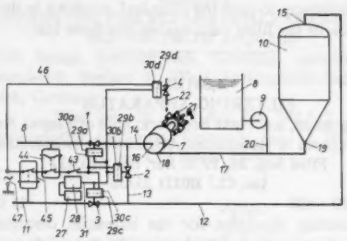
Fritz Strub, St. Gallen, Switzerland, assignor to Filtrox Maschinenbau AG, St. Gallen, Switzerland

Filed Jul. 8, 1976, Ser. No. 703,653

Claims priority, application Switzerland, Jul. 11, 1975, 9073/75

Int. Cl.² B01D *35/14*

U.S. Cl. 210—143 **7 Claims**



1. In a settling layer filtration system including a settling filter having at least one settling layer arranged in a vertical direction wherein the liquid to be filtered is fed through said settling layer by means of an electric powered filter pump, in combination, the improvement of an emergency standby operating means for maintaining in the event of the occurrence of an electric current failure a minimum flow of liquid through said settling filter which is sufficient to maintain said settling layer in vertical working position, said emergency operating means comprising a water turbine having a driving connection with said pump for feeding liquid through said settling filter, means for sensing the occurrence of said current failure, an available source of water under pressure, and means operated in response to said sensing means for connecting said water turbine to said water source to drive said pump to feed said liquid at a flow level at least sufficient to maintain said settling layer in its working orientation.

4,081,377
AQUARIA FILTRATION EQUIPMENT

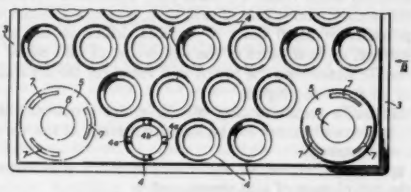
Jeffery Neville Carrington, Dorking, England, assignor to Liquifry Company Limited, Surrey, England

Filed Mar. 22, 1976, Ser. No. 668,664

Claims priority, application United Kingdom, Mar. 26, 1975, 12790/75

Int. Cl.² B01D *23/18*

U.S. Cl. 210—169 **8 Claims**



1. Aquarium filtration equipment for use in an aquarium tank, wherein the equipment comprises a synthetic plastics plate shaped to define a plurality of substantially uniformly spaced, hollow, plate-supporting columns that project downwardly from the general plane of the plate, the columns being open at least at their upper ends so as to interconnect the interiors of the columns and the space above the general plane of said plate, and also defining side openings which interconnect the interiors of the columns and the space beneath the general plane of the plate, said columns having their lower ends contained in a common plane that is inclined to said general plane, and wherein means for the connection to said plate of at least one water circulating means is provided in a region of that plate where the general plane thereof is at substantially its greatest spacing from said common plane which substantially contains the lower ends of the columns.

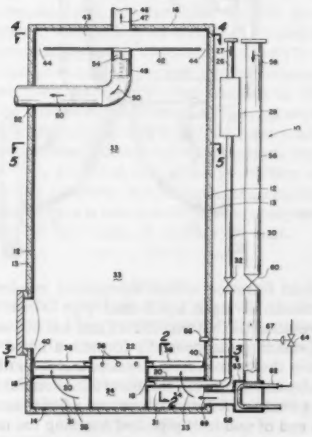
4,081,378
LIQUID AERATION TO REDUCE BIOLOGICAL OXYGEN DEMAND

Robert D. Reed, Tulsa, Okla., assignor to John Zink Company, Tulsa, Okla.

Filed Jan. 17, 1977, Ser. No. 759,915

Int. Cl.² C02B *1/02*; C02C *1/12*

U.S. Cl. 210—177 **12 Claims**



1. Apparatus for liquid aeration, comprising;

(a) a circular cylindrical vessel of selected height, with axis substantially vertical, and having a closed bottom and top;

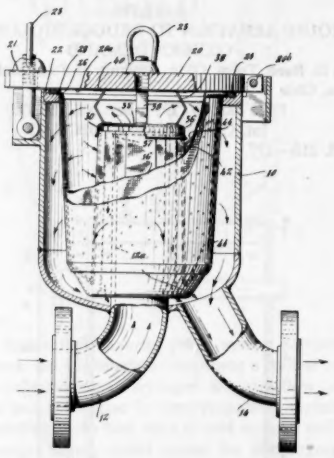
(b) a horizontal dividing wall positioned a selected small distance above the bottom of said vessel, and means for entry of liquid into the space below said dividing wall;
(c) a plurality of spaced narrow slots of selected width in said dividing wall, through which water can flow upwardly in the form of vertical sheets of water from said first space into a second space above said dividing wall; said slots distributed substantially uniformly over the cross-sectional area of said vessel;
(d) air manifold means having a plurality of air pipes of selected small diameter, each pipe positioned vertically, coplanarly, above one of said slots, a selected distance, a plurality of small holes or orifices drilled in the under surface, on both sides of the centerline, of said pipes;
(e) baffle means near the top of said vessel for the separation of air from said liquid;
said baffle means closing off the entire cross-section of said vessel except for an annular passage at the wall of said vessel;
(f) upwardly directed air outlet pipe means at the center of the top closure of said vessel; and
(g) downwardly directed liquid outlet pipe means at the center of said baffle means;
whereby the air-liquid mixture flows upwardly through said annular passage and radially inwardly above said baffle means;
whereby the air and liquid separate and said air flows upwardly through said air outlet pipe, while said liquid flows downwardly through said liguid outlet pipe.

4,081,379

FILTER BAG ARRANGEMENT FOR A PRESSURE VESSEL AND METHOD OF MANUFACTURE THEREOF

Edward A. Smith, Greenwich, Conn., assignor to Advanced Filtration Equipment Corporation, Stamford, Conn.

Filed Oct. 28, 1976, Ser. No. 736,465
Int. Cl.[2] B01D *29/06*
U.S. Cl. 210—232 **9 Claims**



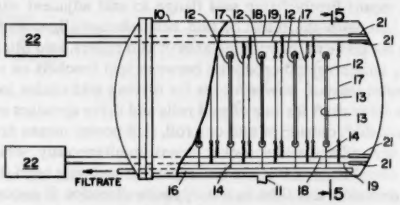
1. A liquid filtration system comprising in combination a pressure vessel having a liquid inlet pipe which enters said pressure vessel at the bottom thereof and has at least a portion thereof upstanding and centrally located, a liquid outlet pipe exiting from the bottom of said vessel and laterally removed from said liquid inlet pipe, a double-walled annular liquid filter bag having necks of different diameters, a fitting mounted over the upper end of said inlet pipe and retaining the neck portion of the inner wall of said annular filter bag, a ring means at the top of said pressure vessel, said ring means retaining the neck portion of the outside wall of said filter at a spaced location relative to said inner wall, and a top plate having means for applying pressure thereto in order to seal said pressure vessel, the liquid flow being from said inlet pipe through said double-walled annular filter and exiting through said liquid outlet pipe.

4,081,380

FILTER CAKE COMPRESSOR

George Erick Johnson, Sausalito, Calif., assignor to CPC International Inc., Englewood Cliffs, N.J.

Filed Mar. 9, 1977, Ser. No. 776,095
Int. Cl.[2] B01D *29/38*
U.S. Cl. 210—332 **4 Claims**



1. In a filtering apparatus of the type wherein a porous, loose filter cake is deposited and builds up on a perforate surface of a filter leaf, an improved means for compressing the filter cake to cleaning, comprising:
a flexible imperforate diaphragm with means tending to maintain the diaphragms in planar configuration;
a plurality of diaphragm support bars positioned in spaced relationship around the periphery of the diaphragm and of the filter leaf, perpendicular to the diaphragm, with means mounting the support bars for longitudinal movement;
means connecting the diaphragm to the support bars with the diaphragm in spaced parallel relationship to the perforate surface of the filter leaf; and
means for moving the support bars in the direction of the filter leaf;
whereby, when the filter cake builds up to a thickness requiring cleaning, the moving means can be activated to move the diaphragm toward the filter leaf, resulting in the compression of the filter cake against the filter leaf.

4,081,381

FILTERING APPARATUS

Peter Rosenmund, and Hans Brodbeck, both of Liestal, Switzerland, assignors to Rosenmund AG, Liestal, Switzerland

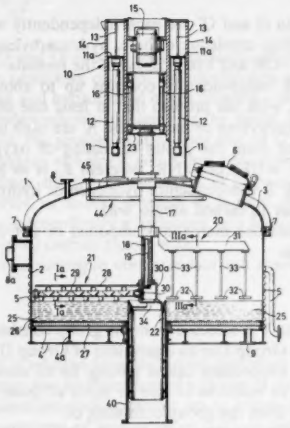
Filed Sep. 24, 1975, Ser. No. 616,422
Int. Cl.[2] B01D *25/38*
U.S. Cl. 210—408 **11 Claims**

1. A filtering apparatus for the industrial discontinuous separation of solids from liquids whereby the solids are accumulated on a filter element to form a filter cake which is removed automatically, said apparatus comprising:
(a) a housing having a floor and a central axis,
(b) means for mounting the filter element inside the housing,
(c) inlet means on one side of the filter element for introducing mother liquor to be filtered,
(d) outlet means on the other side of the filter element to discharge the filtrate,
(e) a filter cake removal opening positioned in the center of the housing floor,
(f) means for removing the solids of the filter cake out of the housing,
(g) said solids removing means being mounted to move for adjustment to the thickness of the filter cake,
(h) said solids removing means including conveyor means mounted to rotate about the central axis for conveying the solids from the filter cake toward the removal opening and removal pipe means mounted to move within the removal opening,

(i) said removal pipe means having a mouth fixedly disposed adjacent the conveyor means to receive said filter cake solids,

(j) means for sealing between the removal opening and the movably disposed removal pipe means to prevent the mother liquor from flowing out therebetween, and

(k) hollow shaft means is mounted for up and down movement coaxially with the vertical main axis of the filtering apparatus,



(l) said conveyor means and an upper section of said removal pipe means being fixedly secured to the hollow shaft means,

(m) said removal pipe means upper section being suspended from the lower end section of the hollow shaft via at least two suspension members which do not obstruct the mouth of the removal pipe means near the delivery end of the conveyor means.

4,081,382

APPARATUS FOR SEPARATING PARTICULATE SOLIDS FROM LIQUIDS

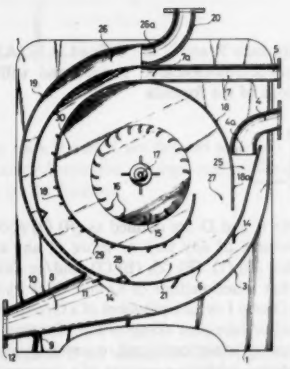
Heinrich Buzga, Grevenbroich, Germany, assignor to Maschinenfabrik Buckau R. Wolf Aktiengesellschaft, Grevenbroich, Germany

Filed Apr. 28, 1977, Ser. No. 792,017

Claims priority, application Germany, Apr. 12, 1976, 2616035

Int. Cl.[2] B01D *35/00*

U.S. Cl. 210—414 **7 Claims**



1. Apparatus for separating particulate solids, especially granules of synthetic plastic materials, from liquids, comprising a pair of upright walls bounding a space; a blower accommodated in said space and mounted on said upright walls for rotation; means for admitting a gaseous medium to said blower to be advanced by the latter during the rotation thereof in a predetermined direction; a sieve extending between said upright walls across said space and surrounding said blower with a spacing therefrom; means for introducing a solid-liquid mixture to be separated into said spacing and onto said sieve at one portion of the latter; means for discharging the separated solids from said spacing at another portion of said sieve which is circumferentially spaced from said one portion; and means for directing the flow of the advancing gaseous medium onto said sieve, including an elongated curved guide element extending between said upright walls in said spacing and having one end located close to said sieve at said introducing means, another end located close to said blower in the region of said one end, and a curved portion extending from said one to said other end around said blower opposite to said direction of rotation of said blower at a decreasing distance from the latter, said guide element bounding with said sieve a passage of decreasing flow-through cross section in the direction of advancement of the gaseous medium whereby the latter gradually and uniformly escapes, and simultaneously expels the liquid, from said passage through said sieve and also propagates along said passage toward said discharging means for propelling the separated solids toward the latter.

4,081,383

ANTI-SOILING TREATMENT FOR CARPETS AND CARPET YARNS

Charles E. Warburton, Jr., Ambler, and Joseph J. Benischeck, Philadelphia, both of Pa., assignors to Rohm and Haas Company, Philadelhia, Pa.

Filed Sep. 2, 1976, Ser. No. 720,014

Int. Cl.[2] C08F *220/06;* **C08G** *59/16;* **D06M** *15/38*

U.S. Cl. 252—8.6 **27 Claims**

1. A composition for the treatment of carpets and carpet yarns to render carpets resistant to soiling and to improve soil release on shampooing, comprising an aqueous dispersion containing 1–50% by weight of a polymeric material selected from:

(A) a mixture of:

(1) 60–98% by weight of a water-insoluble copolymer of 40–75% by weight of methacrylic acid and 60–25% by weight of a copolymerizable monomer system, and

(2) 40–2% by weight of a water dispersible epoxy resin; and

(B) a water-insoluble copolymer of 40–75% by weight of methacrylic acid, 1–25% by weight of a water-dispersible copolymerizable epoxy monomer and 0–95% by weight of a copolymerizable monomer system; wherein said copolymerizable monomer system contains no methacrylic acid, the ratio of equivalents of carboxyl groups to epoxy groups is about 2:1 to 100:1, and the glass transition temperature of cured coatings of the polymeric material is at least 50° C., provided that if the proportion of substantially water insoluble monomers in the copolymerizable monomer system is less than 90%, the copolymer contains at least 50% by weight of methacrylic acid.

4,081,384

SOLVENT-FREE CAPSULES AND FABRIC CONDITIONING COMPOSITIONS CONTAINING SAME

Hans J. Pracht, Cincinnati, Ohio, assignor to The Proctor & Gamble Company, Cincinnati, Ohio

Division of Ser. No. 597,938, Jul. 21, 1975, abandoned. This application Apr. 8, 1976, Ser. No. 674,793

Int. Cl.[2] D06M *13/34*

U.S. Cl. 252—8.8 **6 Claims**

1. A liquid fabric conditioning composition, consisting essentially of:

(a) from 0.1% to 15% of substantially organic solvent-free

capsules having a maximum particle dimension of less than 400 microns having an inner core of a fabric antistat/softener material and, encapsulating said inner core, an outer wall of a polycondensation product formed by interfacial polycondensation;

(b) from 1% to 20% of unencapsulated cationic fabric antistat/softener material; and

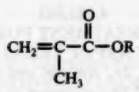
(c) the balance water.

4,081,385
4-VINYLPYRIDINE POLYMETHACRYLATE CONTAINING LUBE OIL COMPOSITIONS

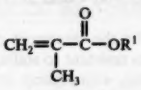
Roy I. Yamamoto, Wappingers Falls; Carmen M. Cusano, and Frank J. Gaetani, both of Poughkeepsie, all of N.Y., assignors to Texaco Inc., New York, N.Y.

Filed Nov. 2, 1976, Ser. No. 737,935
Int. Cl.[2] C10M *1/48, 3/42, 5/24, 7/46*
U.S. Cl. 252—32.7 E **5 Claims**

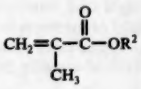
1. A fully formulated crankcase lubricating oil formulation rendering a sulfated ash content of between about 0.05 and 1 wt. % comprising between about 85 and 95 wt. % mineral lubricating oil, between about 0.1 and 10 wt. % of a tetrapolymer of 4-vinylpyridine, a first alkyl methacrylate of the formula:



a second alkyl methacrylate of the formula:



and a third alkyl methacrylate of the formula:



where R is alkyl of from 1 to 6 carbons, R^1 is alkyl of from 10 to 15 carbons and R^2 is alkyl of from 16 to 20 carbons of a molecular weight between about 25,000 and 2,500,000 having a component ratio of 4-VP:C_1–C_6 alkylmethacrylate:C_{10}–C_{15} alkyl methacrylate:C_{16}–C_{20} alkyl methacrylate of between about 2:10:78:10 and 10:30:30:30 and between about 0.1 and 5 wt. % of a calcium containing rust inhibitor for crankcase oils.

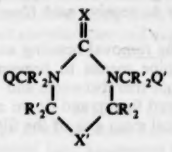
4,081,386
REACTION MIXTURES FROM REACTING DI- AND TRIAZINES WITH SULFUR-CONTAINING COMPOUNDS AND LUBRICANTS AND FUELS CONTAINING THE SAME

Roger L. Sowerby, Mentor, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio

Filed Oct. 1, 1976, Ser. No. 728,586
Int. Cl.[2] C10M *1/48, 3/42, 5/24, 7/46*
U.S. Cl. 252—32.7 E **58 Claims**

1. A composition of matter which is the reaction mixture made by reacting

(A) at least one of the substituted di- and tri-azine compounds of the formula:



wherein Q and Q′ are each independently selected from the group consisting of halo, hydrocarbyloxy of the formula —OR and hydrocarbyl of the formula —R, wherein each R independently contains up to about 20 carbon atoms, with the proviso that at least one of Q and Q′ is hydrocarbyloxy or halo; X and X′ are each independently selected from the group consisting of oxygen, divalent sulfur, =NH, or $=NR_1$ wherein R_1 is as R above; and each R′ is independently hydrogen or hydrocarbyl of up to about 10 carbon atoms; with

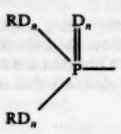
(B) at least one mercapto compound or salt thereof of the formula

ZSY

wherein Y is selected from the group consisting of hydrogen, a Group I or an equivalent of Group II metal cation or an ammonium cation having up to about 20 carbon atoms or mixtures of two or more of these, and Z is selected from the group consisting of:

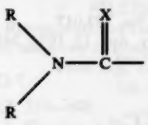
(1) hydrocarbyl groups of the formula —R″ having from 4 to about 40 carbon atoms;

(2) phosphorus acid groups of the formula



wherein each R is defined as in (A); each *n* is independently zero or 1; and each D is independently oxygen or divalent sulfur;

(3) amido-carbo groups of the formula



wherein each R and X are defined as in (A);

(4) hydrocarbyloxycarbo groups and sulfur-containing analogs of the formula

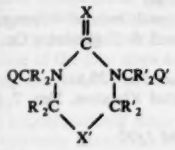
wherein R and D are defined as (B) (2) above; and

(5) mixtures of any two or more of any of the groups within (B) (1), (B) (2), (B) (3), and/or (B) (4);

provided that when neither of Q and Q′ is hydrocarbyloxy, then Y is a Group I or an equivalent of a Group II metal cation.

57. A fuel or lubricant composition of matter comprising a major amount of a lubricating oil or normally liquid fuel and a minor, oxidation inhibiting amount of a composition of matter which is the reaction mixture made by reacting:

(A) at least one of the substituted di- and triazine compounds of the formula



wherein Q and Q′ are each independently selected from the group consisting of halo, hydrocarbyloxy of the formula —OR and hydrocarbyl of the formula —R, wherein each R independently contains up to about 20 carbon atoms, with the proviso that at least one of Q and Q′ is hydrocarbyloxy or halo; X and X′ are each independently selected from the group consisting of oxygen, divalent sulfur, =NH, or $=NR_1$ wherein R_1 is as R above; and each R′ is independently a hydrogen or a hydrocarbyl of up to about 10 carbon atoms; with

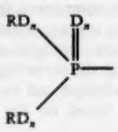
(B) at least one mercapto compound or salt thereof of the formula

ZSY

wherein Y is selected from the group consisting of hydrogen, a Group I or an equivalent of a Group II metal cation or an ammonium cation having up to about 20 carbon atoms or mixtures of two or more of these and Z is selected from the group consisting of:

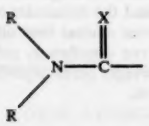
(1) hydrocarbyl groups of the formula —R″ having from 4 to about 40 carbon atoms;

(2) phosphorus acid groups of the formula



wherein each R is defined as in (A); each *n* is independently zero or 1; and each D is independently oxygen or divalent sulfur;

(3) amido-carbo groups of the formula



wherein each R and X are defined as in (A);

(4) hydrocarbyloxycarbo groups and sulfur-containing analogs of the formula

wherein R and D are defined as in (B) (2); and

(5) mixtures of any two or more of any of the groups within (B) (1), (B) (2), (B) (3), and/or (B) (4);

provided that when neither of Q and Q′ is hydrocarbyloxy, then Y is a Group I or an equivalent of a Group II metal cation.

4,081,387

PHOSPHORUS-CONTAINING LUBRICATING COMPOSITIONS

David Eugene Ripple, Kirtland, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio

Filed Mar. 25, 1977, Ser. No. 781,249

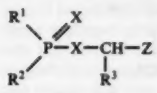
Int. Cl.[2] C10M *1/48, 3/42, 5/24, 7/46*

U.S. Cl. 252—46.6 **19 Claims**

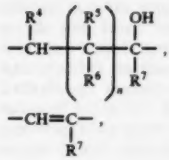
1. A lubricating composition comprising a major proportion of a lubricating oil and a minor effective proportion of at least one additive corresponding to the formula:

$Y^a—S—Y^b$

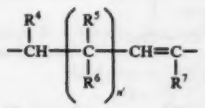
wherein Y^a corresponds to



and Z is



or



wherein each R^1 and R^2 is independently a member selected from the group consisting of hydrocarbyl, hydrocarbyloxy and hydrocarbylmercapto of one to about 30 carbon atoms; R^3 is hydrogen or hydrocarbyl of up to about 10 carbon atoms; R^4 is hydrogen or lower alkyl; R^5 and R^6 are each independently selected from hydrogen, hydrocarbyl, hydrocarbyloxy and hydrocarbylmercapto of one to about 10 carbon atoms; R^7 is hydrogen or hydrocarbyl of one to about 30 carbon atoms; each X is independently oxygen or divalent sulfur; *n* is zero or an integer of one to about 10; *n′* is zero or an integer of one to about 9; Y^b is

$—R^8—H$

or

$—R^8—S—R^9$

wherein R^8 is a divalent hydrocarbyl group of one to about 30 carbon atoms and R^9 is hydrogen or Y^a.

4,081,388

COMPOSITIONS BASED ON ALKENYLSUCCINIMIDES AS ADDITIVES FOR LUBRICATING OILS

Gerard Soula, Meyzieu, and Philippe Duteurtre, Le Havre, both of France, assignors to Orogil, Paris, France

Filed Apr. 5, 1976, Ser. No. 673,975

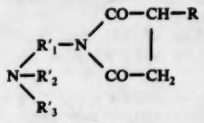
Claims priority, application France, Apr. 18, 1975, 75 12136; Dec. 24, 1975, 75 39691

Int. Cl.[2] C10M *1/32*

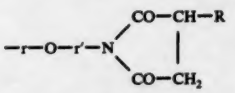
U.S. Cl. 252—51.5 A **26 Claims**

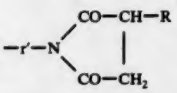
1. New compositions based on alkenylsuccinimides, charac-

terized in that they comprise at least one alkenylsuccinimide of the formula



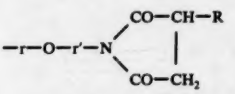
in which formula R is an alkenyl group containing from 20 to 200 carbon atoms, R'_1 is a —r—O—r' radical, R'_2 is one of the radicals

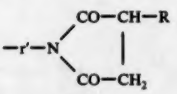




or —r—OH

and R'_3 is one of the radicals





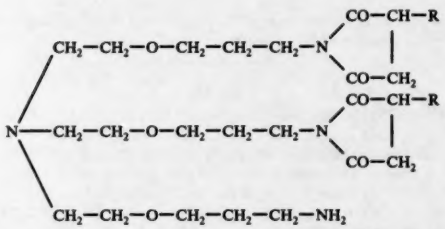
—r—OH

C_1-C_4-alkyl or phenyl,

the radical r representing an optionally branched C_2-C_3-alkyl group and the radical r' representing a propyl or isobutyl group.

2. A composition according to claim 1, wherein the radical r represents an ethyl or isopropyl group.

4. A composition according to claim 1, comprising an alkenylsuccinimide of the formula:



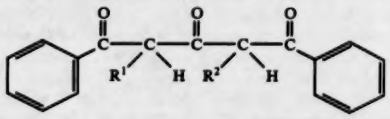
in which formula R is a polyisobutenyl radical containing from 20 to 200 carbon atoms.

4,081,389
LUBRICANT COMPOSITION CONTAINING A TRIKETONE

Brian Swinney, and Roger Scattergood, both of Wantage, England, assignors to Exxon Research & Engineering Co., Linden, N.J.

Filed Nov. 5, 1976, Ser. No. 739,116
Claims priority, application United Kingdom, Nov. 7, 1975, 46193/75
Int. Cl.² C10M 1/20
U.S. Cl. 252—52 R 5 Claims

1. A lubricating oil containing about 0.1 to 20 wt. % of a triketone of the general formula:



where R^1 and R^2 are hydrogen or hydrocarbyl.

4,081,390
VISCOSITY INDEX IMPROVER COMPOSITION

Adrian Richardson, Hull, England, assignor to Orobis Limited, London, England

Filed May 6, 1976, Ser. No. 683,727
Claims priority, application United Kingdom, May 22, 1975, 22400/75; Dec. 5, 1975, 49994/75
Int. Cl.² C10M 1/16
U.S. Cl. 252—59 10 Claims

1. A composition suitable for use as a lubricant additive which consists of from 1 to 15% of a vinyl aromatic/isoprene sequential block copolymer having a number average molecular weight in the range 25,000 to 125,000 and containing from 10 to 40% by weight of the vinyl aromatic component, from 5 to 45% of a polybutene having a number average molecular weight in the range 5,000 to 60,000 and the remainder of the composition being a solvent neutral base oil; the percentages of vinyl aromatic/isoprene copolymer, polybutene and base oil being expressed as weight percentages based on the total weight of the composition.

10. A lubricant composition consisting of a major proportion of a lubricant base oil and a minor proportion of a composition consisting of from 1 to 15% of a vinyl aromatic/isoprene sequential block copolymer having a number average molecular weight in the range 25,000 to 125,000 and containing from 10 to 40% by weight of the vinyl aromatic component, from 5 to 45% of a polybutene having a number average molecular weight in the range 5,000 to 60,000 and the remainder of the composition being a 100 to 150 solvent neutral base oil; the percentages of vinyl aromatic/isoprene copolymer, polybutene and base oil being expressed as weight percentages based on the total weight of the composition.

4,081,391
LIQUID DEVELOPER FOR USE IN ELECTROPHOTOGRAPHY

Kazuo Tsubuko; Tsuneo Kurotori; Taro Kimura; Toshiyuki Kawanishi, and Yoshikazu Kaneko, all of Tokyo, Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Filed Aug. 29, 1975, Ser. No. 608,832
Claims priority, application Japan, Sep. 3, 1974, 49-100590
Int. Cl.² G03G 9/12
U.S. Cl. 252—62.1 L 5 Claims

1. A liquid developer for use in electrophotography, consisting essentially of a toner dispersed in a carrier liquid having a high resistivity and a low dielectric constant, said toner having a mean particle size in the range of from 0.1 to 1 micron and consisting essentially of pigment or dye particles, a non-aqueous resin dispersion and an additive copolymer, said non-aque-

ous resin dispersion having been prepared by carrying out successively the following four steps (a), (b), (c) and (d) in an aliphatic hydrocarbon organic solvent or a halogenated aliphatic hydrocarbon solvent, at an elevated temperature, adding wax or polyethylene having a softening point of 60° to 130° C in one of the four steps and dissolving it in the solvent, and cooling the reaction product of step (d) while stirring vigorously:

(a) copolymerizing from 99.9 to 80 parts by weight of a monomer having the formula (I)

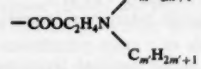
wherein R is hydrogen or methyl, A is $-COOC_nH_{2n+1}$ or $-OC_nH_{2n+1}$, and n is an integer of from 6 to 20, with from 0.1 to 20 parts by weight of at least one co-monomer selected from the group consisting of an unsaturated carboxylic acid, glycidyl acrylate and glycidyl methacrylate;

(b) esterifying 100 parts by weight of the copolymer obtained in step (a) with from 0.1 to 20 parts by weight of glycidyl acrylate or glycidyl acrylate when said copolymer has been prepared by using an unsaturated carboxylic acid, or esterifying 100 parts by weight of the copolymer obtained in step (a) with from 0.1 to 20 parts by weight of said unsaturated carboxylic acid when said copolymer has been prepared by using glycidyl acrylate or glycidyl methacrylate;

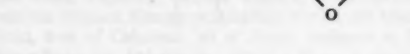
(c) grafting 100 parts by weight of the esterified copolymer obtained in step (b) with from 5 to 100 parts by weight of a monomer having a vinyl group;

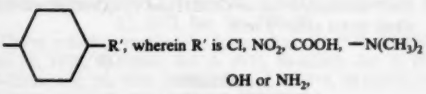
(d) polymerizing 100 parts by weight of the graft copolymer obtained in step (c) with from 0.1 to 20 parts by weight of a compound selected from the group consisting of maleic acid, fumaric acid, allylamine, vinylamine, aroyl alcohol, vinyl sulfonic acid, vinyl phosphate and a vinyl monomer having the formula

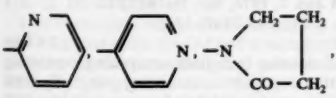
wherein R is hydrogen or methyl, and B is



wherein m and m′ are integers from one to 4,







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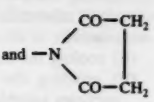


and wherein the amount of said wax or polyethylene added is as follows:

when added in step (a), from 5 to 50 parts by weight of said wax or polyethylene, per 100 parts by weight of the sum of the weights of said monomer (I) and said co-monomer, when added in step (b), from 5 to 50 parts by weight of said wax or polyethylene, per 100 parts by weight of the copolymer obtained in step (a),

when added in step (c), from 1 to 40 parts by weight of said wax or polyethylene, per 100 parts by weight of the esterified copolymer obtained in step (b), and when added in step (d), from 5 to 50 parts by weight of said wax or polyethylene, per 100 parts by weight of the graft copolymer obtained in step (c),

and said additive copolymer is a copolymer of a first monomer selected from the group consisting of styrene, methylmethacrylate and vinyl toluene, and a second monomer selected from the group consisting of acrylic acid, methacrylic acid, lauryl methacrylate, lauryl acrylate, stearyl acrylate, stearyl methacrylate, hydroxyethyl acrylate, hydroxyethyl methacrylate, 2-ethylhexylacrylate and 2-ethylhexyl methacrylate, copolymerized at a molar ration of 3/7 to 7/3, the amount of said additive copolymer being from one to 40 parts by weight, per 100 parts by weight of said resin dispersion.

4,081,392

INSULATION BLOCK AND METHOD OF MAKING SAME

Theodore F. Carosello, Painesville, Ohio, assignor to Progressive Research Products, Inc., Painesville, Ohio

Filed Jun. 6, 1977, Ser. No. 803,529
Int. Cl.[2] C04B *43/00*
U.S. Cl. 252—62 **2 Claims**

1. A method of forming a highly efficient insulating block consisting of taking an expanded insoluble aggregate formed by:

(A) mixing, at a temperature less than boiling, an aqueous alkali metal silicate having an alkali metal oxide: silicon dioxide weight ratio of from about 1:3.0–7.0 with an essentially anhydrous alkali metal silicate within the same weight ratio range, the amount of anhydrous added being that quantity sufficient to give, in combination with the aqueous, a total alkali metal silicate solids content of from 80–40% by weight and the amount of alkali metal silicate solids being 40–90% by weight, dry basis, of the total resultant aggregate;

(B) admixing, prior to the time when the anhydrous alkali metal silicate becomes substantially hydrated, two insolubilizing compounds as follows;

(1) a primary insolubilizer capable of reacting with the alkali portion of the alkali metal silicate at temperatures less than boiling, the amount used being that sufficient to reduce hygroscopicity of the silicate to the point where caking of the composition prior to expansion but subsequent to grinding is prevented and

(2) a secondary insolubilizer capable of reacting with the silicate portion of the alkali metal silicate at temperatures used in expanding same, the amount being that sufficient to render the expanded aggregate water-insoluble, the total amount of insolubilizers used being less than the stoichiometric amount required for total reaction with the alkali metal silicate present;

(C) continuing mixture until the components will not separate on standing at temperatures up to boiling;

(D) curing the mixed composition at temperatures up to

boiling until the anhydrous alkali metal silicate has become substantially hydrated and the primary insolubilizer reacted;

(E) cooling the composition to a grindable solid;

(F) grinding the composition into discrete nonadherent particles suitable for expansion and

(G) rapidly expanding the particles and causing the secondary solubilizer to react by exposure to temperatures of from about 800°–1800° F., to provide an insoluble lightweight aggregate which is free flowing in small clusters, having an average density in loose bulk of 2.5 to 3.5 pounds per cubic foot, and having a water absorption of 1.5 gallons per cubic foot, said insoluble lightweight aggregate being sized at substantially 10 meshes per inch, this lightweight aggregate material at any temperature up to 165° F. is then mixed with a binder consisting of 5 to 8% of polyvinyl chloride dissolved in a solvent free of water consisting of 15% dimethylsulfoxide and 85% methyl ethyl ketone at a temperature between ambient and 170° F., until the saturated condition of the mixture turns it from white to gray, while mechanically stirring such mixture, thus forming a thick paste, and then pour said mixture into a suitable mold for said insulating block, and then dry said molded form.

4,081,393

ELECTRICAL INSULATING OILS CONTAINING TRIALKYL BENZENES

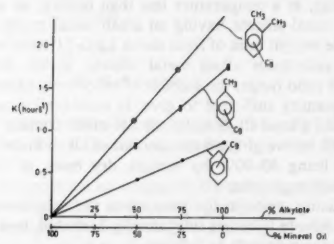
Jean-Paul Berthelot, Mont-Saint-Aignan, and Pierre Dominique Marin, Rouen, both of France, assignors to Exxon Research & Engineering Co., Linden, N.J.

Filed Dec. 15, 1976, Ser. No. 751,054

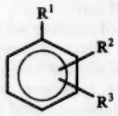
Claims priority, application United Kingdom, Dec. 16, 1975, 51431/75; Feb. 4, 1976, 4365/76

Int. Cl.² C10M *1/16*; H01B *3/22*

U.S. Cl. 252—63 **8 Claims**



1. An electrical insulating oil having hydrogen absorption and oxidation stability comprising from 5 to 80% by weight of a trialkyl benzene of the general formula:



wherein R_1, R_2 and R_3 are all alkyl groups, with R_1 and R_2 containing no more than 6 carbon atoms and R_3 containing from 5 to 15 carbon atoms and from 95 to 20% by weight of a mineral oil.

4,081,394

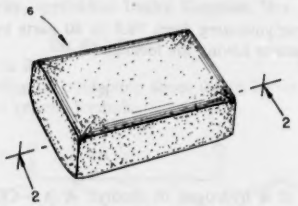
SOAP BAR

Louise M. Bartley, 56-08 134th St., Flushing, N.Y. 11355

Filed Sep. 17, 1976, Ser. No. 724,304

Int. Cl.² C11D *9/00, 17/00, 17/04*

U.S. Cl. 252—91 **2 Claims**



1. As an article of manufacture, a cake of soap comprising an outer soft shell of soap, an intermediate soap shell harder than the outer shell, said intermediate soap shell being completely enclosed in said outer shell, an inner core of soap harder than the intermediate soap shell,

said inner core of soap being completely enclosed in said intermediate soap shell.

4,081,395

ALKALINE DETERGENT COMPOSITIONS

Charles Bullick Talley, Drexel Hill, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 622,337, Oct. 14, 1975, abandoned. This application Mar. 25, 1976, Ser. No. 670,305

Int. Cl.² C11D *1/08, 1/14, 3/10, 3/34*

U.S. Cl. 252—106 **13 Claims**

1. The granular concentrate for dissolving in water to clean soiled surfaces made from polycarbonate, polypropylene, polyethylene or glass, said concentrate consisting essentially of the following ingredients expressed as percent by weight:

Alkali metal silicate selected from the group consisting of orthosilicates and metasilicates - 5 to 28,

Alkali metal phosphate - 5 to 27,

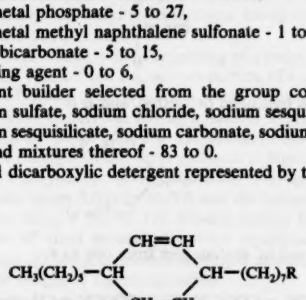
Alkali metal methyl naphthalene sulfonate - 1 to 15,

Sodium bicarbonate - 5 to 15,

Defoaming agent - 0 to 6,

Detergent builder selected from the group consisting of sodium sulfate, sodium chloride, sodium sesquicarbonate, sodium sesquisilicate, sodium carbonate, sodium bicarbonate, and mixtures thereof - 83 to 0.

and C-21 dicarboxylic detergent represented by the formula



in which one X is hydrogen while the second X is carboxylic, "in which R can be COOH and CH_2OSO_3H and their alkali metal salts" 1 to 9.

4,081,396

METHOD OF CLEANING

Thomas E. Batterton, 25 Pine St., Princeton, N.J. 08540

Filed Jan. 7, 1976, Ser. No. 647,322

Int. Cl.² C11D *3/48*

U.S. Cl. 252—106 **1 Claim**

1. A method of cleaning beer lines comprising contacting said beer lines with a composition consisting essentially from about 2 to about 6 ounces by weight of a water soluble alkali

metal phosphorous salt selected from a member of the group consisting of the hypophosphites (XH_2PO_2) the phosphites (X_2HPO_3) the hypophosphites ($X_4P_2O_6$), the phosphates (X_3PO_4) and the perphosphates (X_3PO_5), the symbol "X" is an alkali metal, from about 0.25 to about 1.5 ounces by volume of tincture of iodine, said tincture of iodine consisting essentially of a mixture of from about 4 to about 10 grams of iodine, from about 3 to about 7 grams of an alkali metal iodide and from about 3 to about 7 ml. of water, said mixture being brought up to 100 ml. in volume by the addition thereto of a lower molecular weight water soluble alcohol selected from a member of the group consisting of methanol and ethanol, and from about 0.25 to about 1.5 quarts of water, said alkali metal being selected from a member of the group consisting of sodium, potassium and ammonium cations.

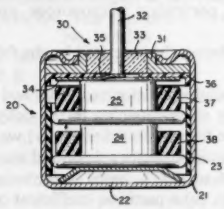
4,081,397
DESICCANT FOR ELECTRICAL AND ELECTRONIC DEVICES

James M. Booe, Indianapolis, Ind., assignor to P. R. Mallory & Co. Inc., Indianapolis, Ind.

Continuation of Ser. No. 887,307, Dec. 22, 1969, abandoned, which is a continuation-in-part of Ser. No. 631,241, Apr. 17, 1967, abandoned. This application Dec. 3, 1971, Ser. No. 204,737

Int. Cl.[2] C09K *3/10*

U.S. Cl. 252—194 **10 Claims**



1. An elastomeric desiccant means for use in a closure containing an electrical component, the elastomeric desiccant consisting essentially of a dehydrating agent selected from fluid absorbing alkaline earth oxide particles having a particle size not greater than about 80 mesh dispersed in an elastomeric matrix material having the property of retarding the rate of fluid absorption of the alkaline earth particles, the elastomeric material having a viscosity not greater than about 50,000 centipoises at the time of introduction of the alkaline earth oxide to the elastomeric material, the elastomeric material being selected from the group consisting of silicon RTV rubbers, vinyl plastisols, polyurethane rubbers, and silicon potting and encapsulating materials containing recuring siloxane units, the alkaline earth oxide constituting about 5 to about 80 percent by weight of the elastomeric desiccant means.

4,081,398
FLUORESCENT COMPOSITIONS

Takashi Hase, Fujisawa; Akiyasu Kagami, Ninomiyamachi; Yoshiyuki Mimura, Kamakura; Kinichiro Narita, and Minoru Hiraki, both of Chigasaki, all of Japan, assignors to Dai Nippon Toryo Co., Ltd., Osaka, Japan

Division of Ser. No. 701,128, Jun. 30, 1976. This application Jan. 17, 1977, Ser. No. 760,098

Claims priority, application Japan, Jun. 30, 1975, 50-80607; Jun. 30, 1975, 50-80608; Jul. 3, 1975, 50-82201; Jul. 3, 1975, 50-82202; Aug. 26, 1975, 50-103250; Jul. 4, 1975, 50-81948; Aug. 29, 1975, 50-104644; Jul. 4, 1975, 50-81949

Int. Cl.[2] C09K *11/46*

U.S. Cl. 252—301.4 R **7 Claims**

1. A fluorescent composition comprising a mechanical mixture of indium oxide (In_2O_3) and a europium activated yttrium phosphor selected from the group consisting of yttrium oxysulfide, (Y_2O_2S) yttrium oxide (Y_2O_3) and yttrium vanadate (YVO_4), said indium oxide and said phosphor being present in a weight ratio of from 1:9 to 9:1, the amount of europium contained in said phosphor being from 10^{-2} to 1.5×10^{-1} gram per gram of yttrium oxysulfide, yttrium oxide or yttrium vanadate.

4,081,399
PROCESS FOR THE PREPARATION OF CONCENTRATED SOLUTIONS OF FLUORINATED AMPHOTERIC SURFACTANTS

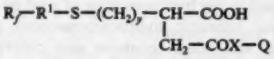
Robert Ernest Arthur Dear, Mount Kisco, and Thomas W. Cook, Yorktown Heights, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Sep. 22, 1975, Ser. No. 615,339

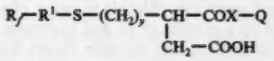
Int. Cl.[2] B01F *17/28*

U.S. Cl. 252—356 **4 Claims**

1. A process for the preparation of a concentrated solution of fluorinated amphoteric surfactants of the formulae


I

and its isomer


II

wherein

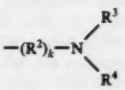
R_f is straight or branched chain perfluoroalkyl of 1 to 18 carbon atoms or said perfluoroalkyl substituted by perfluoroalkoxy of 2 to 6 carbon atoms,

R^1 is branched or straight chain alkylene of 1 to 12 carbon atoms, alkylenethioalkylene of 2 to 12 carbon atoms, alkyleneoxyalkylene of 2 to 12 carbon atoms or alkyleneiminoalkylene of 2 to 12 carbon atoms where the nitrogen atom contains as a third substituent hydrogen or alkyl of 1 to 6 carbon atoms,

y is 1 or zero,

X is oxygen or —NR, wherein R is hydrogen, lower alkyl of 1 to 6 carbon atoms, hydroxyalkyl of 1 to 6 carbon atoms, or R together with Q forms a piperazine ring, and

Q is an aliphatic amino group of the formula



wherein

R^2 is a linear or branched alkylene of 2 to 12 carbon atoms, oxygen or sulfur interrupted linear or branched alkylene of up to 60 carbon atoms, or hydroxyl substituted alkylene;

k is 1 or zero, with the proviso, that if X is oxygen, k is 1;

R^3 and R^4 are each independently of the other an alkyl group of 1-4 carbon atoms ; said process comprising

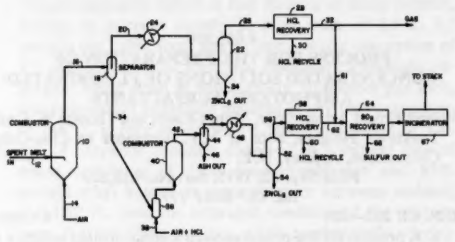
(a) reacting in a 1:1 ratio an aqueous solution of an amine with an anhydride previously dissolved in an anhydrous, non-reactive water miscible organic solvent, at a temperature of between 10° to 25° C and

(b) reacting the product obtained in the first step with an R_f-thiol in the presence of a non-reactive, water miscible thiol solvent, the ratio of the water miscible thiol solvent to water being such that the product is a homogeneous liquid composition.

4,081,400
REGENERATION OF ZINC HALIDE CATALYST USED IN THE HYDROCRACKING OF POLYNUCLEAR HYDROCARBONS

Everett Gorin, San Rafael, Calif., assignor to Continental Oil Company, Stamford, Conn.

Filed Feb. 1, 1977, Ser. No. 764,616
Int. Cl.[2] B01J *27/32*
U.S. Cl. 252—415 **2 Claims**



1. A process for regenerating spent molten zinc chloride which has been used in the hydrocracking of coal or ash-containing polynuclear aromatic hydrocarbonaceous materials derived therefrom and which contains zinc chloride, zinc oxide, zinc oxide complexes and ash-containing carbonaceous residue, comprising in combination, the following steps:

(a) subjecting said spent zinc chloride to vapor phase oxidative treatment by a mixture of air and hydrogen chloride gas to produce effluent zinc chloride vapors which contain entrained zinc oxide, zinc oxide complexes and residual ash-containing carbonaceous solids;

(b) separating the zinc chloride vapors from the entrained solids;

(c) subjecting the separated solids to vapor phase oxidative treatment by a mixture of air and hydrogen chloride gas to yield zinc chloride in vapor form; and

(d) recovering said zinc chloride in a substantially solids-free molten state.

2. A process for regenerating spent molten zinc halide which has been used in the hydrocracking of coal or ash-containing polynuclear aromatic hydrocarbonaceous materials derived therefrom and which contains, in addition to zinc halide, zinc sulfide, organic residue and ash, comprising in combination, the following steps:

(a) subjecting said spent zinc halide to vapor phase oxidative treatment by combustion of the carbon and sulfur components at a temperature maintained at least high enough to assure vaporization of the zinc halide, whereby effluent vapors are produced in which solids containing zinc oxide, zinc oxide complexes and ash are entrained;

(b) separating the zinc halide vapors from said solids;

(c) treating the separated solids with hydrogen halide gas under conditions favoring the reaction of zinc oxide and hydrogen halide at a temperature sufficiently high to form zinc halide in the vapor state; and

(d) separating the vaporous zinc halide from the ash and condensing it to the molten state.

4,081,401
PROCESS FOR PRODUCING ADSORBENT

Shinsuke Takegami; Takashi Korenaga, and Chiharu Yoshinaga, all of Okayama, Japan, assignors to Japan Exlan Company Limited, Osaka, Japan

Filed Oct. 28, 1976, Ser. No. 736,527
Claims priority, application Japan, Nov. 17, 1975, 50-138312
Int. Cl.[2] B01J *31/02;* C02B *1/14;* B01D *15/00;* C04B *31/40*
U.S. Cl. 252—428 **6 Claims**

1. A process for producing an adsorbent, which comprises adding an acid selected from the group consisting of hydrochloric acid, sulfuric acid, nitric acid, acetic acid and para-toluenesulfonic acid to an aqueous mixture containing

1. 100 weight parts, calculated on a dry weight basis, of an activated sludge-containing material formed by subjecting organic waste water to an activated sludge treatment, and

2. at least 5 weight parts of a water-soluble primary condensate of a formaldehyde resin and/or an aldehyde compound selected from the group consisting of a monoaldehyde, glyoxal, malondialdehyde, succindialdehyde and phthalaldehyde, to adjust the pH of the aqueous mixture to a value below 5, so that the mixture may be permitted to cure, and subjecting the mixture to a granulating operation during or after the curing.

4,081,402
HYDROPHILIC ABSORBENTS

Didya D. Levy, Brooklyn, N.Y., and Samuel H. Ronel, Princeton, N.J., assignors to National Patent Development Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 384,230, Jul. 31, 1973, abandoned. This application Feb. 19, 1975, Ser. No. 551,016
Int. Cl.[2] B01J *31/02;* A61K *31/74*
U.S. Cl. 252—428 **17 Claims**

1. An article of manufacture comprising a hydrophilic polymer matrix and particulate microporous sorbent dispersed therein,

A. said article being characterized by the following properties:

(i) solid, (ii) insoluble in deionized water and lower alkanols, (iii) normally shape-retaining in the dehydrated state as well as in the fully hydrated state, (iv) water-swellable to the extent that is possesses a deionized water-uptake value of from 200% to 2200%, based on the weight of the dehydrated article, (v) a partition coefficient of at least 2, (vi) an average molecular weight diffusion limitation of about 10,000 Daltons, and (vii) a gross external surface area no greater than about one percent of the total surface area of total microporous sorbent dispersed therein;

B. said polymer (i) having an average molecular weight greater than about 40,000, and (ii) a deionized water-uptake value in the range of from 60% to 4000%, based on the weight of said polymer; and

C. the concentration of said sorbent being in the range of from 0.01 to 50 weight percent, based on the weight of said polymer.

4,081,403
ADSORBENT FOR THE TREATMENT OF WASTE WATER

Shinsuke Takegami; Takashi Korenaga, and Chiharu Yoshinaga, all of Okayama, Japan, assignors to Japan Exlan Company Limited, Osaka, Japan

Filed Oct. 28, 1976, Ser. No. 736,528
Claims priority, application Japan, Nov. 11, 1975, 50-135953
Int. Cl.[2] B01J *31/02;* C02B *1/14;* B01D *15/00;* C04B *31/40*
U.S. Cl. 252—428 **11 Claims**

1. An adsorbent for the treatment of waste water, comprising a granular material containing activated sludge, said granular material being prepared by subjecting a mixture containing (1) 100 weight parts of an activated sludge-containing material, calculated on a dry weight basis, formed by subjecting organic waste water to an activated sludge treatment, and (2) at least 5 weight parts of a water-soluble primary condensate of a formaldehyde resin and/or a dialdehyde compound selected from the group consisting of glyoxal, malondialdehyde, succindialdehyde and phthaldialdehyde, to a heat curing treatment at 60° to 250° C. and to a granulating operation.

4,081,404

OLIGOMERIZATION OF UNSATURATED HYDROCARBONS WITH A MOLYBDENUM CATALYST

Elmar Wilms, Dusseldorf-Benrath, and Georg Michalczyk, Neukirchen-Vluyn, both of Germany, assignors to Deutsche Texaco Aktiengesellschaft, Hamburg, Germany

Division of Ser. No. 625,966, Oct. 28, 1975. This application Dec. 17, 1976, Ser. No. 751,934

Claims priority, application Germany, Oct. 28, 1974, 2451127

Int. Cl.[2] B01J *27/02;* C07C *3/10*

U.S. Cl. 252—439 5 Claims

1. A catalyst comprising sulfur containing molybdenum on a support and suitable for oligomerizing unsaturated hydrocarbons prepared by heating a composite comprising molybdenum sulfide or ammonium tetrathiomolybdenate or mixtures thereof on a support at a temperature of about 300° to 700° C. in an oxidizing atmosphere, said catalyst comprising from about 5.0 to 11.0 weight percent molybdenum, about 3.0 to 7.0 weight percent sulfur and the remainder support.

4,081,405

PREPARATION OF CATALYSTS OF PREDETERMINED PORE SIZE DISTRIBUTION AND PORE VOLUME

Willard H. Sawyer, Baton Rouge, La., assignor to Exxon Research & Engineering Co., Linden, N.J.

Continuation-in-part of Ser. No. 646,491, Jan. 5, 1976, Pat. No. 4,016,107, and a continuation-in-part of Ser. No. 646,490, Jan. 5, 1976, Pat. No. 4,016,106. This application Nov. 26, 1976, Ser. No. 745,584

Int. Cl.[2] B01J *21/04, 21/12, 23/64, 23/84*

U.S. Cl. 252—455 R 39 Claims

1. In a process for the formation of a catalyst comprised of a Group VI-B or Group VIII metal, or both, composited with alumina in a series of steps which include

precipitating alumina hydrogel from a solution which contains a hydrous form of alumina in concentration ranging from about 1 to about 5 percent, based on the weight of the solution, and a compound having an anion which forms an aluminum salt soluble in an alkaline medium, at temperatures ranging from about 15° F to about 120° F and pH ranging from about 8 to about 12,

separating said alumina hydrogel from said alkaline solution,

contacting said alumina hydrogel with a solution of a water soluble polymer containing from about 2 to about 24 monomer units from the group consisting of (a) polyethylene glycols, (b) polypropylene glycols, and (c) polyethylene amines sufficient to absorb the polymer into the pores of the alumina hydrogel and displace water from the pores until the weight ratio of polymer:alumina with the hydrogel ranges from about 0.5:1 to about 4:1,

forming a slurry of the polymer containing alumina hydrogel,

spray drying said slurry of polymer containing alumina hydrogel by countercurrent contact of an atomized spray of the alumina hydrogel with air at temperature sufficient to form granules of boehmite,

forming a paste from the granules of polymer containing boehmite and water, the paste containing at least about 20 percent by weight of solids,

mulling said water soluble polymer containing boehmite paste to provide a substantially homogeneous mass,

extruding said polymer containing boehmite paste through a die to form spaghetti-like extrudate shapes,

sizing and shaping the boehmite,

contacting and extracting said boehmite shapes with a solvent to separate and remove the water soluble polymer therefrom,

drying and calcining the shapes, and converting the boehmite shapes from which the polymer has been extracted to gamma alumina,

the improvement comprising

impregnating the gamma alumina shapes by contacting same with a solvent containing a compound, or compounds, of the Group VIB or Group VIII metal, or both,

drying said metal containing gamma alumina shapes at a rate of solvent evaporation of less than about 2° F per minute, and then again

calcining said metal containing gamma alumina shapes to form the catalyst.

4,081,406

PREPARATION OF CATALYSTS OF PREDETERMINED PORE SIZE DISTRIBUTION AND PORE VOLUME

Willard H. Sawyer, Baton Rouge, La., assignor to Exxon Research & Engineering Co., Linden, N.J.

Continuation-in-part of Ser. No. 646,490, Jan. 5, 1976, Pat. No. 4,016,106, and a continuation-in-part of Ser. No. 646,491, Jan. 5, 1976, Pat. No. 4,016,107. This application Nov. 26, 1976, Ser. No. 745,429

Int. Cl.[2] B01J *21/04, 21/12, 23/64, 23/84*

U.S. Cl. 252—455 R 30 Claims

1. In a process for the formation of a catalyst comprised of a Group VI-B or Group VIII metal, or both, composited with alumina in a series of steps which include

precipitating alumina hydrogel from a solution which contains a hydrous form of alumina in concentration ranging from about 1 to about 5 percent, based on the weight of the solution, and a compound having an anion which forms an alkaline soluble aluminum salt in an alkaline medium, at temperatures ranging from about 15° F. to about 120° F. and pH ranging from about 8 to about 12,

separating said alumina hydrogel from said alkaline solution,

contacting said alumina hydrogel with a solution of a water soluble polymer containing from about 2 to about 24 monomer units from the group consisting of (a) polyethylene glycols, (b) polypropylene glycols, and (c) polyethylene amines sufficient to absorb the polymer into the pores of the alumina hydrogel and displace water from the pores until the weight ratio of polymer: alumina within the hydrogel ranges from about 0.5:1 to about 4:1,

forming a slurry of the polymer containing alumina hydrogel,

spray drying said slurry of polymer containing alumina hydrogel by countercurrent contact of an atomized spray of the alumina hydrogel with air at temperature sufficient to form granules of boehmite,

forming a paste from the granules of polymer containing boehmite and water, the paste containing at least about 20 percent by weight of solids, and

mulling said water soluble polymer containing boehmite paste to provide a substantially homogeneous mass,

the improvement comprising:

extruding said polymer containing boehmite paste through a die to form spaghetti-like extrudate shapes by applying a torque ranging from about 25 to about 55 inch pounds,

sizing and shaping the boehmite,

contacting and extracting said boehmite shapes with a solvent to separate and remove the water soluble polymer therefrom, and then

drying and calcining the shapes, and converting the boehmite shapes from which the polymer has been extracted to gamma alumina.

4,081,407

CATALYST SUPPORT PREPARED BY ALCOHOL TREATMENT OF HYDROGELS

James N. Short, and Donald R. Witt, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 18, 1976, Ser. No. 667,935

Int. Cl.[2] B01J *21/08, 23/26*

U.S. Cl. 252—458 4 Claims

1. A method for producing a supported catalyst said catalyst suitable producing ethylene polymer having a melt index in

excess of about 6.6 in a particle form polymerization process, said method comprising: for producing

1. forming a silica-containing hydrogel;
2. impregnating said hydrogel with an amount of a chromium-containing compound suitable for catalyzing an ethylene polymerization reaction;
3. treating said hydrogel to remove water with an aliphatic alcohol chosen from the group consisting of 1-pentanol, 3-methyl-1-butanol, 4-methyl-2-pentanol, 2,2-dimethyl-1-propanol and 1-hexanol, said treating comprising azeotropic distillation or continuous extraction;
4. removing said alcohol from the water-free gel thereby recovering a solid, particulate material; and
5. calcining said particulate material in a substantially dry, molecular oxygen-containing gas at a temperature and for a time sufficient to activate the catalyst.

4,081,408

CATALYST COMPOSITION

Ronald H. Fischer, Oakton, Va.; Julius Ciric, Pitman, and Thaddeus E. Whyte, Jr., Cherry Hill, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 615,458, Sep. 22, 1975, abandoned, which is a continuation-in-part of Ser. No. 518,671, Oct. 29, 1974, abandoned, which is a division of Ser. No. 455,442, Mar. 27, 1974, Pat. No. 3,867,282. This application Nov. 15, 1976, Ser. No. 742,151

Int. Cl.[2] B01J *21/04, 21/10, 23/84*

U.S. Cl. 252—465 **4 Claims**

1. A catalyst composition which comprises a magnesium aluminate spinel having a surface area of greater than about 50 m^2/g, a total pore volume of greater than about 0.475 cc/g, from about 50 to about 70 percent of the total pore volume in pores of diameter of from about 50 Angstroms to about 150 Angstroms, greater than about 30 percent of the total pore volume in pores of diameter of from about 80 Angstroms to about 150 Angstroms and from about 5 to about 20 percent of the total pore volume in pores of diameter of greater than 300 Angstroms, said magnesium aluminate spinel having deposited thereon from about 1 to about 5 weight percent cobalt oxide and from about 8 to about 20 weight percent molybdenum oxide.

4,081,409

METHOD FOR PREPARING FUEL CELL CATALYSTS

Brian D. McNicol, and Richard T. Short, both of Chester, England, assignors to Shell Oil Company, Houston, Tex.

Filed Jan. 28, 1977, Ser. No. 763,387

Claims priority, application United Kingdom, Feb. 20, 1976, 6869/76

Int. Cl.[2] B01J *23/62, 23/64, 23/82, 23/84*

U.S. Cl. 252—472 **7 Claims**

1. Method for the preparation of a catalyst, suitable for fuel cell electrodes, which catalyst comprises as catalyst metal a transition metal of the Group VIII of the Periodic Table and a co-catalyst selected from the group consisting of tin, lead, arsenic, antimony, bismuth, rhenium, thallium, tantalum and titanium which method comprises covering the catalyst metal with oxygen before or during immersion in a liquid compound of the co-catalyst or a solution of a compound of the co-catalyst, said compound being selected from the group consisting of oxides, hydroxides and compounds convertible to oxides or hydroxides under electrochemical oxidation conditions, and thereafter separating the catalyst from said liquid or said solution.

4,081,410

POLYSILOXANE SURFACTANTS USEFUL FOR FOAMING POLYURETHANE FOAMS

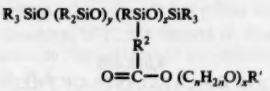
Richard E. Moeller, Troy, N.Y., assignor to General Electric Company, Waterford, N.Y.

Continuation-in-part of Ser. No. 540,671, Jan. 13, 1975, abandoned, which is a division of Ser. No. 99,717, Dec. 18, 1970, abandoned. This application Mar. 31, 1976, Ser. No. 672,087

Int. Cl.[2] C08G *18/14;* C07F *7/02*

U.S. Cl. 260—2.5 AH **3 Claims**

1. A polyurethane foam composition formed from a mixture of a polyether or polyester, a polyisocyanate, a blowing agent in minor amounts sufficient to foam the mixture, a catalyst for catalyzing the reaction between the polyether or polyester and polyisocyanate and a polysiloxane surfactant in sufficient amount to control the foam comprising a compound of the formula,



where y is a whole number varying from 15 to 150 and z is a whole number varying from 3 to 16 where R and R′ are monovalent hydrocarbon radicals of less than 8 carbon atoms, R^2 is selected from alkylene and arylene radicals of from 11 to 20 carbon atoms, n is an integer that varies from 2 to 4, x varies from 5 to 30 for the case n is equal to 2, x varies from 1 to 40 for the case n is equal to 3 and 4 where there may be ether units with n equal to 2, 3 and 4 in the same molecule.

4,081,411

WATER-DISPERSED COATING COMPOSITION OF SHORT OIL ALKYD RESIN AND ALKANOLAMINE

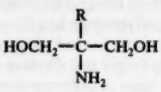
Jerry Hoyt Hunsucker, Terre Haute, Ind., assignor to IMC Chemical Group, Inc., Terre Haute, Ind.

Filed Jul. 30, 1976, Ser. No. 719,078

Int. Cl.[2] C09D *3/64*

U.S. Cl. 260—22 R **11 Claims**

1. A water dispersed coating composition consisting essentially of a mixture of an amine-neutralized short oil alkyd resin and an alkanolamine represented by the formula



where R is hydrogen, methyl, ethyl or hydroxymethyl in a concentration of 15% to about 40% by weight of the alkyd resin.

4,081,412

COATING COMPOSITIONS

Andrew Doroszkowski, Marlow, and Peter Francis Nicks, Maidenhead, both of England, assignors to Imperial Chemical Industries Limited, United Kingdom

Filed Feb. 23, 1976, Ser. No. 660,118

Claims priority, application United Kingdom, Feb. 27, 1975, 8226/75

Int. Cl.[2] C09D *3/66, 5/02*

U.S. Cl. 260—22 CQ **10 Claims**

1. A method of producing a paint composition, said composition comprising a pigmented solution of a water-insoluble film-forming base resin in a water-immiscible liquid and the solution of base resin being emulsifiable in an aqueous synthetic detergent solution, wherein one of the method steps comprises treating at least a proportion of the pigment in dispersion in a water-immiscible liquid with an auxiliary resin which (a) is co-emulsifiable in the aqueous detergent solution with the

pigment when dissolved in the water-immiscible liquid of the paint composition, and (b) is preferentially adsorbed by the pigment from a solution of both the base resin and the auxiliary resin in the water-immiscible liquid of the paint composition, and wherein the pigment of the paint composition comprises a pigment having an acidic coating, the coating surface having a zero zeta potential at a pH of less than 3.5, the final paint composition being satisfactorily emulsifiable in a 5% by weight solution of a synthetic detergent.

4,081,413

POLYVINYL CHLORIDE COMPOSITIONS

Axel W. Tybus, New York, and Leonard A. Fabrizio, North Bellmore, both of N.Y., assignors to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Continuation-in-part of Ser. No. 465,403, Apr. 29, 1974, Pat. No. 3,929,700. This application Dec. 29, 1975, Ser. No. 644,966

The portion of the term of this patent subsequent to Dec. 30, 1992, has been disclaimed.

Int. Cl.² C08L *91/00*

U.S. Cl. 260—23 XA **16 Claims**

1. A polyvinyl chloride composition which is formable at elevated temperatures and is a shape-retaining solid at room temperatures and which is capable of being formed into a plastic sheet having the following properties.

a tensile strength at yield of above about 2,000 psi, an elongation at yield of between 3% and 30%, a flexural modulus of between about 0.5×10^5 and 7×10^5 psi, a notched Izod of between 0.3 and 30 foot pounds per inch of notch, a Rockwell hardness of between 75 and 110 on the R scale, and a Vicat softening point of between 60° C and 80° C, comprising

100 parts by weight of polyvinyl chloride,

about 0.7 to 14 parts of a polyvinyl chloride plasticizer,

about 4 to 25 parts of a polyvinyl chloride impact-modifier,

about 1 to 3 parts of a polyvinyl chloride processing aid,

about 1 to 3 parts of at least one polyvinyl chloride lubricant,

at least one polyvinyl chloride stabilizer and at least one polyvinyl chloride stabilizer booster in an amount between about 6 and 11 parts of said stabilizer and stabilizer booster.

4,081,414

HOT MELT ADHESIVE COMPOSITION FOR HOT MELT BONDING OF FIBROUS OR SURFACE-POROUS MATERIALS

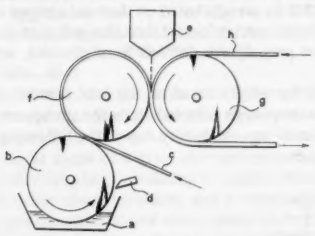
Mitsuo Abe; Tetsuo Murata; Minoru Furuichi; Nobuhide Shiraishi; Shohei Wada; Seiji Tai, and Tsukasa Maeda, all of Yokkaichi, Japan, assignors to Japan Synthetic Rubber Co., Ltd., Tokyo, Japan

Filed Dec. 11, 1975, Ser. No. 639,837

Claims priority, application Japan, Dec. 21, 1974, 49-147174

Int. Cl.² C08L *91/00*

U.S. Cl. 260—23.7 R **17 Claims**



1. A hot melt adhesive composition consisting essentially of 100 parts by weight of polybutadiene having a 1,2-bond structure content of not less than 70% and a crystallinity of not less than 10%, from 50 to 1000 parts by weight of at least one inorganic filler, from 10 to 300 parts by weight of at least one tackifier, and at least one of plasticizer and/or at least one of flow improving agent, said composition having an melt viscosity of from 50 to 50,000 poises within a temperature range from 100° to 150° C.

4,081,415

HOT MELT ADHESIVE COMPOSITION

Saburo Matubara, Yokohama, and Sakuya Iwai, Tokyo, both of Japan, assignors to Nippon Oil Company Ltd., Japan

Filed Oct. 6, 1976, Ser. No. 730,209

Claims priority, application Japan, Oct. 9, 1975, 50-121336

Int. Cl.² C08L *91/00*

U.S. Cl. 260—28.5 AV **6 Claims**

1. A hot melt adhesive composition which comprises a tackifying resin, an ethylene copolymer and a wax, said tackifying resin resulting from the polymerization of a thermally-cracked petroleum fraction which has a boiling point in the range of 140° – 220° C and in which the content of conjugated diolefin is 0.7 weight percent or less, the ratio of conjugated diolefin content to the polymerizable component is 3 percent or less, the total content of indene and its alkyl derivatives is 2 weight percent or less, and the ratio of indene content to the polymerizable component is 8 percent or less, said polymerization being carried out at a temperature in the range of from −30° C to +60° C in the presence of a Friedel-Crafts catalyst added in amounts of 0.01 – 5 weight percent based on said fraction.

4,081,416

HIGH GLOSS LATEX COATINGS CONTAINING MERCAPTAN-TERMINATED EMULSION COPOLYMER AND DISSOLVED CARBOXYL-FUNCTIONAL RESIN SALT

Donald J. Berenschot, Chicago; Dale F. Anders, Fox River Grove, and Fred D. Hawker, Villa Park, all of Ill., assignors to DeSoto, Inc., Des Plaines, Ill.

Filed Nov. 9, 1976, Ser. No. 740,234

Int. Cl.² C08L *61/28*

U.S. Cl. 260—29.4 UA **15 Claims**

1. Pigmented thermosetting aqueous latex coating composition adapted to deposit adherent coatings which cure on baking to provide superior gloss, comprising an aqueous latex of aqueous emulsion copolymer particles, said copolymer particles being hydroxyl-functional and mercaptan-terminated and said aqueous latex containing a carboxyl-functional resin salt dissolved in the aqueous continuum of the latex, said emulsion copolymer particles constituting at least about 60% of the weight of the resin solids to be cured and said dissolved resin salt providing the balance of the resin solids to be cured, said emulsion copolymer particles consisting essentially of at least about 70% by weight of nonreactive monoethylenically unsaturated material containing reactive groups of which at least about 4% by weight provides the non-nitrogenous hydroxy group, and an aminoplast resin dispersed in said latex to enable the thermosetting cure to take place.

4,081,417

PROCESS FOR PREPARING WATER-DILUTABLE, HEAT-CURING COATING COMPOSITIONS

Kwan Ting Shen, Lakewood, N.J., and Timothy L. Pickering, Emmaus, Pa., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 589,505, Jun. 23, 1975, abandoned. This application Jan. 31, 1977, Ser. No. 764,121

Int. Cl.² C08L *63/02, 61/28*

U.S. Cl. 260—29.2 EP **20 Claims**

1. A process for preparing water-dilutable, heat-curable coating compositions which comprises

(a) reacting a poly(1,2-epoxide), having a molecular weight in the range of 1,500 to 5,000 with sufficient active hydrogen compound to react with substantially all the free

epoxy groups followed by a second reaction with ethylene oxide to form a modified epoxy resin containing in the range of 10 to 90% by weight of grafted and ungrafted poly(ethylene oxide) with less than 20% being ungrafted poly(ethylene oxide),

(b) adding 5 to 50% by weight of solids of an aminoplast curing agent, and

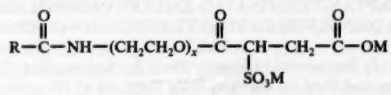
(c) diluting with water to bring the total percent solids in the range of 10 to 80% by weight and to yield a stable, aqueous composition containing no particles larger in size than 0.1 micron.

4,081,418
EMULSIFIERS USEFUL FOR EMULSION POLYMERIZATION OF VINYL MONOMERS

Girish Chandra Barua, Stamford, Conn., and Herbert Burkhard, Eastchester, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed May 10, 1976, Ser. No. 685,038
Int. Cl.² C08L *33/02, 33/08, 33/10*
U.S. Cl. 260—29.6 MQ **5 Claims**

1. A process for making a latex of emulsified polymer, said process comprising emulsion polymerization of a mixture of monomers including at least one monomer selected from the group consisting of acrylic acid, methacrylic acid and alkyl esters thereof, and which mixture may further comprise at least one other vinyl monomer selected from the group consisting of styrene, vinyl acetate, N-methylolacrylamide, acrylonitrile, and itaconic acid in an aqueous suspension containing a free radical polymerization catalyst and an emulsifier having the formula:



wherein

is the acyl radical of a fatty acid having 7 to 21 carbon atoms and

M is a solubilizing cation selected from ammonium, the alkali metals, and alkaline earth metals, and

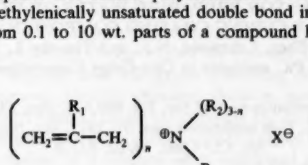
x is 2 or 3.

4,081,419
PROCESS FOR PRODUCING A POLYMER EMULSION

Akihiko Shimizu, and Takao Hayashi, both of Shin-nanyo, Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Japan

Filed May 28, 1976, Ser. No. 690,906
Claims priority, application Japan, Jun. 12, 1975, 50-70166
Int. Cl.² C08L *9/10*
U.S. Cl. 260—29.6 HN **6 Claims**

1. A process for producing a cationic polymer emulsion which comprises free radical polymerization of a monomer having an ethylenically unsaturated double bond in the presence of from 0.1 to 10 wt. parts of a compound having the formula:



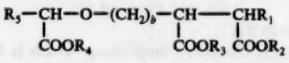
wherein R_1 represents hydrogen or methyl; R_2 represents hydrogen, methyl or ethyl; R_3 represents an alkyl group having from 6 to 22 carbon atoms; n is 1, 2 or 3 and X represents a halogen atom; per 100 wt. parts of the monomer, wherein 2,2'-azobisisobutylamidine hydrochloride is the free radical initiator.

4,081,420
CARBOXYMETHYLOXYSUCCINIC ACID ESTERS AS PLASTIC PLASTICIZERS

Vincent Lamberti, Upper Saddle River, N.J., assignor to Lever Brothers Company, New York, N.Y.

Division of Ser. No. 629,182, Nov. 5, 1975, Pat. No. 3,996,150, which is a division of Ser. No. 271,852, Jul. 14, 1972, Pat. No. 3,943,165. This application Jul. 19, 1976, Ser. No. 706,415
Int. Cl.² C08J *3/18*
U.S. Cl. 260—31.8 R **4 Claims**

1. A plastic composition comprising a polymer and as a plasticizer for the polymer from about 1 to about 75 weight percent based on the weight of the total plastic composition of a compound havng the formula:



wherein R_1 is selected from the group consisting of —H and —CH_3; R_2, R_3 and R_4, which may be the same or different substituents, are selected from the group consisting of straight and branched chain alkyl groups having from 1 to 12 carbon atoms, benzyl and cyclohexyl; R_5 is selected from the group consisting of —H, —CH_3 and —C_2H_5; and, $b = 0,1$.

4,081,421
CURABLE RESIN COMPOSITION FOR ABRASION-RESISTANT COATING

Masaru Yoshida, and Isao Kaetsu, both of Takasaki, Japan, assignors to Japan Atomic Energy Research Institute, Tokyo, Japan

Filed Sep. 15, 1975, Ser. No. 613,608
Claims priority, application Japan, Sep. 18, 1974, 49-106778
Int. Cl.² C08G *65/22;* **C08K** *5/01, 5/05, 5/07*
U.S. Cl. 260—32.8 EP **12 Claims**

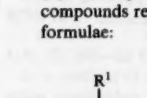
1. A curable resin composition for forming an abrasion-resistant coating consisting essentially of:

A. 95–50% by weight of a prepolymer derived from glycidol by heating it together with a solvent therefor and a catalyst selected from the group consisting of mineral acids, sulfonic acid, polyphosphoric acid, pyrophosphoric acid, iodic acid, trichloroacetic acid, periodic acid, halogens, Lewis acids, complexes of Lewis acid and either of ether and alcohol, and laurates naphthenates and octylates of transition elements until the viscosity reaches a value of 3–100 cp, wherein said prepolymer may contain monomeric glycidol,

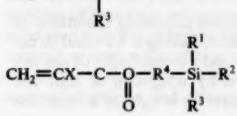
B. 5–50% by weight of a solvent in which glycidol and said prepolymer derived from glycidol are soluble,

C. 0.05–10% by weight based on the total amount of (A) and (B) of a polymerization catalyst that polymerizes glycidol and said prepolymer derived from glycidol, and optionally

D. 5–40% by weight based on the total amount of (A) and (B) of compounds selected from the group consisting of compounds represented by any of the following chemical formulae:



I



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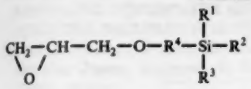
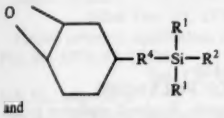


III



IV

and

V

wherein R^1, R^2 and R^3 are respectively either of alkoxy and alkoxyalkoxy respectively having up to 6 carbon atoms, which may be the same or different; R^4 is alkylene having up to 6 carbon atoms and X is either of hydrogen and methyl; and hydrolysates thereof.

4,081,422

THERMOPLASTIC MOLDING COMPOSITIONS FROM TEREPHTHALIC ACID-BUTANE-1,4-DIOL-BUT-2-ENE-1,4-DIOL POLYESTERS

Claus Cordes, Weisenheim, and Hans-Josef Sterzel, Dannstadt-Schauernheim, both of Germany, assignors to Keil, Thompson & Shurtleff, Rheinland, Pfalz, Germany

Filed Jun. 25, 1976, Ser. No. 699,987

Claims priority, application Germany, Aug. 6, 1975, 2535021

Int. Cl.² C08L *67/06*

U.S. Cl. 260—40 R **8 Claims**

1. Polyesters manufactured by polycondensing terephthalic acid or its lower alkyl esters with butane-1,4-diol and from 10 to 80 mole % of but-2-ene-1,4-diol, based on the total amount of diol employed, and which have a relative viscosity of not less than 1.4, measured in 0.5% strength solution in a mixture of phenol and o-dichlorobenzene in a weight ratio of 3:2, at 25° C.

6. Thermoplastic molding compositions as set forth in claim 1, which contain, as stabilizers, from 0.05 to 5% by weight of a phosphorus compound and/or of sterically hindered phenols and/or carbodiimides or polycarbodiimides.

4,081,423

SPREADING OR COATING COMPOSITION

Jarl Hardenfelt, Copenhagen, Denmark, assignor to Jarl Hardenfelt Material Development Centre, Copenhagen, Denmark

Continuation of Ser. No. 432,095, Jan. 9, 1974, abandoned. This application Apr. 7, 1976, Ser. No. 674,439

Claims priority, application Denmark, Jan. 9, 1973, 88/73

Int. Cl.² C08L *67/00*

U.S. Cl. 260—40 R **10 Claims**

1. A decorative coating composition for coating a surface of an article and for obtaining a metallic appearance of said surface consisting essentially of a settable organic binder, a powder of a single metal of a grain size not exceeding 1 mm and selected from the group consisting of copper, bronze, iron, tin, zinc, and noble metal powders, and a substantial amount of graphite particles, the ratio of said organic binder to said metallic powder and graphite particles being 15 to 200 parts of said organic binder to 100 parts of said metallic powder and graphite particles, said 100 parts of said metallic powder and said graphite particles consisting of 10 to 30 parts by weight of said graphite particles and 90 to 70 parts by weight of said metallic powder, said composition being free of solvent.

4,081,424

MULTICOMPONENT POLYOLEFIN - BLOCK COPOLYMER - POLYMER BLENDS

William P. Gergen, and Sol Davison, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 693,463, Jun. 7, 1976, abandoned. This application Feb. 7, 1977, Ser. No. 766,174

Int. Cl.² C08L *51/00, 53/00*

U.S. Cl. 260—42.18 **27 Claims**

1. A composition comprising the admixture obtained by intimately mixing about 4 to about 40 parts by weight of a block copolymer, about 5 to about 48 parts by weight of at least one dissimilar engineering thermoplastic, and a polyolefin in a weight ratio of polyolefin to dissimilar engineering thermoplastic of at least 1:1, so as to form a polyblend wherein at least two of the polymers have at least partial continuous interlocked networks with each other and wherein:

(a) said block copolymer comprises at least two monoalkenyl arene polymer end blocks A and at least one substantially completely hydrogenated conjugated diene polymer mid block B, said block copolymer having an 8 to 55 percent by weight monoalkenyl arene polymer block content, each polymer block A having an average molecular weight of between about 5,000 and about 125,000, and each polymer block B having an average molecular weight of between about 10,000 and about 300,000;

(b) said polyolefin has a molecular weight in excess of about 10,000 and an apparent crystalline melting point of between about 100° C and about 250° C; and

(c) said dissimilar engineering thermoplastic resin is capable of forming a continuous structure and is selected from the group consisting of poly(aryl ethers), poly(aryl sulfones) and acetal resins.

4,081,425

PROCESS FOR THE MANUFACTURE OF LIGHT COLOR TERPENEPHENOLS

Manfred Gscheidmeier, Gablingen, and Karl Hacker, Augsburg, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Continuation-in-part of Ser. No. 742,209, Nov. 16, 1976, abandoned. This application Mar. 9, 1977, Ser. No. 775,837

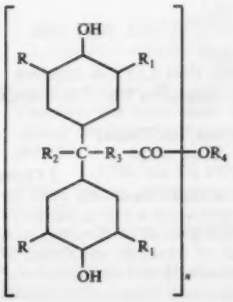
Claims priority, application Germany, Nov. 21, 1975, 2552175

Int. Cl.² C08G *61/00*

U.S. Cl. 260—62 **2 Claims**

1. A process for the manufacture of light color terpenephenols by reaction of terpene hydrocarbons with phenols in the presence of from 5 to 20% by weight (relative to the terpene hydrocarbon) of a cation exchange resin or a bleaching earth as catalyst, at a temperature of from 50° to 100° C, which comprises using a heavily acidic, completely anhydrous cation exchange resin or an anhydrous bleaching earth, operating in the presence of from 0.01 to 5.0% by weight (relative to the terpene hydrocarbon) of an antioxidant of the formulae I, II or III

I



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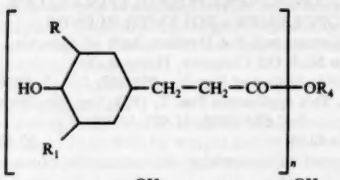

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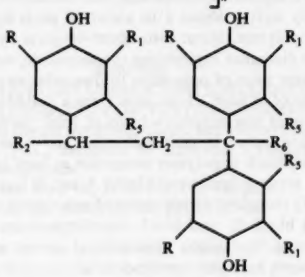


III

where

n is 1, 2, 3 or 4,

R is alkyl having from 1 to 4 carbon atoms,

R_1, R_2 and R_5 each are H or alkyl having from 1 to 4 carbon atoms,

R_3 is alkylene having from 1 to 6 carbon atoms,

R_4 is mono-, di-, tri- or tetrahydric alcohol having from 1 to 30 carbon atoms, and

R_6 is H or alkyl having from 1 to 6 carbon atoms, separating the catalyst from the reaction mixture after the reaction is complete, and subsequently blowing off unreacted starting substances by means of steam.

4,081,426

PREPARATION OF AMINOPLASTS

Walter Michel; Hans Honel, both of Frankfurt am Main, and Manfred Schon, Dudenhofen, all of Germany, assignors to Cassella Farbwerke Mainkur Aktiengesellschaft, Germany

Filed Apr. 15, 1976, Ser. No. 677,131

Claims priority, application Germany, Apr. 15, 1975, 2516349

Int. Cl.² C08G *12/26*

U.S. Cl. 260—67.6 R **4 Claims**

1. In the process of preparing an etherified methylolaminotriazine resin concentrate from the aminotriazine, formaldehyde, an etherifying alcohol and an acid condensation catalyst, the improvement according to which those materials are interreacted in essentially a single step by mixing them in a proportion providing 0.77 to 3 mols of formaldehyde, 2.5 to 7 mols of alcohol having up to four carbons, and no more than 3 mols of water, for every mol of $—NH_2$ in the aminotriazine, at least 40 mol precent of the alcohol being methanol, heating the mixture in a closed container at a pressure at least as high as 0.1 atmosphere gauge and a temperature from about 85° to about 115° C, and terminating the condensation after 0.2 to 20 minutes of such heating.

4,081,427

SOLVENTLESS ELECTRICAL INSULATION RESINS

Daniel J. Lange, St. Louis, Mo., assignor to The P. D. George Company, St. Louis, Mo.

Filed Dec. 20, 1974, Ser. No. 534,681

Int. Cl.² C08G *63/68, 63/20*

U.S. Cl. 260—75 N **1 Claim**

1. A solventless electrical conductor insulating resin for application in molten state to a wire which is a polyester-polyimide derived from 12 equivalent percent of dimethyl terephthalate, 20 equivalent percent of trimellitic anhydride, 27 equivalent percent of ethylene glycol, 31 equivalent percent of tris (2-hydroxyethyl) isocyanurate, and 10 equivalent percent of methylene diphenylamine having a viscosity of not more than 5000 cps at between about 80 to 250° C.

4,081,428

PREPARATION OF POLYMERS

Ronald Austin Thompson, Harrogate, England, assignor to Imperial Chemical Industries Limited, Great Britain

Filed Sep. 24, 1976, Ser. No. 726,163

Claims priority, application United Kingdom, Sep. 24, 1975, 39132/75

Int. Cl.² C08G *63/68, 63/22*

U.S. Cl. 260—75 N **9 Claims**

1. A process for the preparation of a high molecular weight, linear polyesteramide comprising the steps of

(a) reacting at least one dicarboxylic acid of the formula HOOC—D—COOH with at least one glycol of the formula HO—E—OH wherein

$D = (R)_m$ and $E = (R)_q$

m being an integer from 3 to 10

q being an integer from 2 to 12, and

R being independently selected from the group consisting of (CH_2), a combination of (CH_2) and $(CH\ CH_3)$, and a combination of (CH_2) and $(C(CH_3)_2)$,

to produce an initial, hydroxy-terminated, polyester having a molecular weight within the range 700 to 10,000,

(b) reacting the initial polyester in the presence of a catalyst with a diaryl ester of a carboxylic acid of the formula $A—OOC—(X)_n—COOB$

wherein *n* is selected from 0 and 1,

X is a divalent aromatic group, and A and B are each independently a monovalent aryl group having 6 to 20 carbon atoms

the molecular ratio of the diaryl ester of the carboxylic acid to the polyester being within the range 1.5:1 to 5:1, to give a capped polyester in which virtually all the ends are derived from the diaryl ester of the dicarboxylic acid, and

(c) reacting the capped polyester with a diamine at a temperature above 220° C.

4,081,429

HEAT-STABILIZED POLYURETHANE ELASTOMER

Ransome J. Wyman, Redondo Beach, and Laxmi C. Gupta, South Gate, both of Calif., assignors to ARNCO, Marina del Rey, Calif.

Filed Feb. 13, 1976, Ser. No. 657,717

Int. Cl.² C08G *18/24*

U.S. Cl. 260—77.5 AB **2 Claims**

1. The method of making heat-stabilized polyurethane elastomer catalyzed with an organo-metallic catalyst, which comprises the steps of:

combining a mixture of isocyanate-terminated prepolymer and polyester or polyether polyol with an organo-metallic catalyst and sulfur in an amount at least equal to the mole-equivalent of metal ions in the catalyst;

curing the mixture at a temperature below that at which the sulfur reacts with the metal ions of the catalyst;

subjecting the cured mixture to conditions of elevated temperature at which the sulfur will react with the metal ions of the catalyst and thereby prevent depolymerization of the elastomer.

4,081,430

AROMATIC POLYAMIDE CRYSTALLINE COMPLEX AND THE METHOD FOR PRODUCING THE SAME

Shunsuke Minami; Hideto Kakida, and Jun Nakauchi, all of Ohtake, Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed Oct. 19, 1976, Ser. No. 734,009
Claims priority, application Japan, Oct. 20, 1975, 50-126205; Feb. 20, 1976, 51-17526
Int. Cl.[2] C08G *69/46*
U.S. Cl. 260—78 S 18 Claims

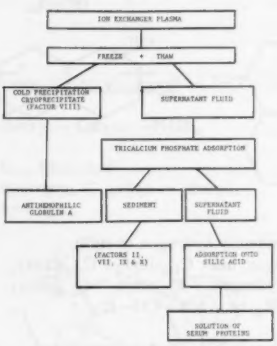
1. A crystalline complex which consists essentially of an aromatic polyamide and from 0.3 to 2.5 moles of at least one member selected from the group consisting of hexamethylphosphoric amide, N-methyl-2-pyrrolidone, ϵ-caprolactam and 2-pyrrolidone per mole of said aromatic polyamide, at least 75 mol % of repeating unit of said aromatic polyamide being m-phenyleneisophthalamide, wherein said crystalline complex has a maximum melting point of 156° C.

4,081,431

BLOOD FRACTIONATION

Wolfgang Stephan, Dreieichenhain, and Ronald Kotitschke, Frankfurt am Main, both of Germany, assignors to Biotest-Serum-Institut GmbH, Frankfurt am Main Niederrad, Germany

Filed Dec. 11, 1975, Ser. No. 639,960
Claims priority, application Germany, Dec. 14, 1974, 2459291
Int. Cl.[2] A23T *1/06*
U.S. Cl. 260—112 B 10 Claims



1. A process for the fractionation of blood consisting essentially of sequentially taking blood from a donor, passing said blood through a cation exchanger, separating the solids from the plasma, freezing the plasma, thawing the frozen plasma and separating from the thawed plasma fluid a first product comprising undissolved cryoprecipitate enriched in factor-VIII protein; dissolving the first product, removing impurities from the solution of the first product, precipitating the factor-VIII protein from the solution; after separation of the first product treating the residual thawed plasma fluid with a solid adsorbent thereby to adsorb the factors II, VII, IX and X, and separating a second product comprising solid adsorbent and the adsorbed factors from the residual plasma; and, after separation of the second product, contacting the residual plasma with colloidal silica and separating a third product comprising a storage-stable serum protein solution from the colloidal silica.

4,081,432

METHOD OF SEPARATING A FACTOR IX PREPARATION FROM PLASMA USING ETHYLENE-MALEIC ANHYDRIDE POLYMERS

Jacques J. Delente, University City, and Richard A. Schoenfeld, St. Louis, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Jul. 25, 1977, Ser. No. 818,920
Int. Cl.[2] C07G *7/00*
U.S. Cl. 260—112 B 6 Claims

1. A method of separating a Factor IX preparation from plasma comprising contacting liquid blood plasma at a pH of from about 7.5 to about 8.5 with from about 0.025% to about 0.1% by weight of the plasma of a water-insoluble, cross-linked polyelectrolyte copolymer of ethylene and maleic anhydride containing pendant diloweralkylaminoloweralkyl functional groups whereby Factors II, IX and X are selectively adsorbed by the polyelectrolyte copolymer to the substantial exclusion of Factors VII and VIII which are unadsorbed and remain in the liquid plasma.

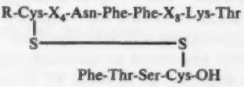
4,081,433

D-Nle[4]-SOMATOSTATIN AND ANALOGUES THEREOF

Dimitrios Sarantakis, West Chester, Pa., assignor to American Home Products Corporation, New York, N.Y.

Filed Jan. 13, 1977, Ser. No. 759,203
Int. Cl.[2] C07C *103/52*; A61K *37/00*
U.S. Cl. 260—112.5 S 9 Claims

1. A polypeptide of the formula:



its linear precursor or a non-toxic acid addition salt thereof, in which

R is hydrogen or Ala—Gly—;

X_4 is D—Nle, D—Val, D—Phe, D—Tyr or D—Trp; and

X_8 is L—Trp or D—Trp.

4,081,434

NOVEL ANALOGS OF β-ENDORPHIN

Choh Hao Li, Berkeley, Calif., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Mar. 11, 1977, Ser. No. 776,568
Int. Cl.[2] C07C *103/52*; A61K *37/00*
U.S. Cl. 260—112.5 R 7 Claims

1. An analog of β-endorphin of the sequence β-endorphin-(1-5)-(16-31).

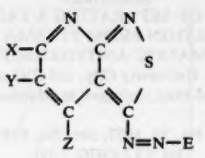
4,081,435

DISPERSE AZO DYESTUFFS DERIVED FROM A 3-AMINO-7-AZABENZ-2,1-ISOTHIAZOLE DIAZO COMPONENT

David Boyd Baird; Brian Ribbons Fischwick; James Stanley Campbell, and Peter Smith, all of Manchester, England, assignors to Imperial Chemical Industries Limited, Great Britain

Filed Sep. 27, 1976, Ser. No. 727,384
Claims priority, application United Kingdom, Oct. 27, 1975, 44132/75
Int. Cl.[2] C09B *29/08, 29/26*
U.S. Cl. 260—156 2 Claims

1. A disperse monoazo dyestuff free from sulphonic acid and fiber-reactive groups which is of the formula:



wherein

X is selected from hydrogen, lower alkyl, —NH lower alkyl, lower alkylthio, lower alkoxy and lower alkylsulphonyl;

Z is selected from hydrogen, lower alkyl and phenyl;

Y is selected from hydrogen, nitro and cyano; and

E is the residue of a coupling component selected from coupling components of the acylacetarylamide, pyrazolone, aminopyrazole, phenol, naphthol, 2:6-dihydroxypyridine and arylamine series.

4,081,436

PROCESS FOR DRY QUATERNIZATION OF AZO COMPOUNDS

Richard Benjamin Balsley, Lebanon, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed Sep. 20, 1976, Ser. No. 724,509

Int. Cl.² C09B *43/00*

U.S. Cl. 260—156 **8 Claims**

1. A process for the preparation of quaternary ammonium salts of organic dye bases selected from the group consisting of 2-(p-dimethylaminophenylazo)-6-methoxy benzothiazole, 1-(3-pyridylazo)-2-naphthol and 1-{p-[2-dimethylaminoethyl)ethylamino]phenylazo}-2-chloro-4-nitrobenzene, which comprises intimately contacting said solid dye base with an essentially stoichiometric amount of an alkylating agent, at a temperature of from about 30° C. to about 90° C., said alkylating agent being added to said dye base gradually in a manner such that the reaction mixture is a free-flowing solid throughout the reaction.

4,081,437

WATER SOLUBLE POLYAZO DYESTUFFS

Pierre Frank, and André Louis Sailer, both of Saint Clair du Rhone, France, assignors to Produits Chimiques Ugine Kuhlmann, Paris, France

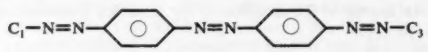
Filed Apr. 21, 1975, Ser. No. 569,729

Claims priority, application France, Apr. 25, 1974, 74 14388

Int. Cl.² C09B *31/16, 31/28, 31/30, 33/18*

U.S. Cl. 260—159 **2 Claims**

1. Dyestuff of the formula:



wherein C_1 and C_3 are selected from the group consisting of:

ethyl acetylacete-2-yl;

1-phenyl-3-methyl-4-yl-5-pyrazolone, in which the benzene nucleus is substituted by a sulfonic acid group in the 3′ or 4′ positions or by 2 sulphonic acid groups in the 2′, 5′ positions and by from 0 to 2 chlorine atoms;

1-(4′-sulpho-phenyl)-4-yl-3-carboxy-5-pyrazolone;

acetoacetanilide-2-yl;

phenol-yl;

1,3-dihydroxybenzene-yl; 1,3-diaminobenzene-yl;

2,4-diaminotoluene-yl; and

1-aminonaphthalene-yl-6- or 7-sulpho;

wherein C_1H and C_3H are coupling components and C_1 is different from C_3, and each of C_1 and C_3 is free from azo groups, and further wherein one at least of C_1 and C_3 have at least one and at most 2 sulphonic acid groups.

4,081,438

ANIONIC AZO DYES HAVING A 3-DIBENZOFURANYL DIAZO COMPONENT RADICAL OPTIONALLY HAVING A2-OR 8-SULFO GROUP

Francsois Benguerel, Binningen, and Jean-Jacques Salzmann, Aesch, both of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

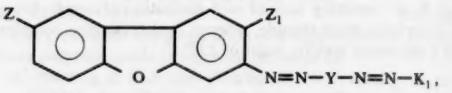
Filed Apr. 29, 1975, Ser. No. 572,765

Claims priority, application Switzerland, May 4, 1974, 6050/74

Int. Cl.² C09B *31/14*

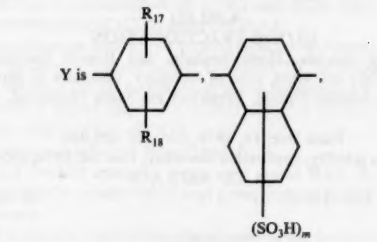
U.S. Cl. 260—160 **13 Claims**

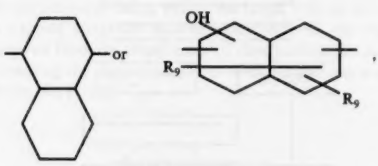
1. A compound of the formula



or a salt thereof, wherein each of

Z and Z_1 is independently hydrogen or sulfo, with the proviso that at least one of Z and Z_1 is hydrogen,





wherein each

R_9 is independently hydrogen or sulfo,

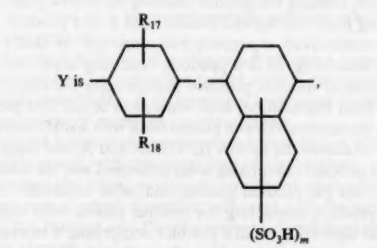
R_{17} is hydrogen, halo, C_{1-4}alkyl or C_{1-4}alkoxy,

R_{18} is hydrogen, C_{1-4}alkyl, C_{1-4}alkoxy, —NH—CO—NHR_{22} or —NH—CO—R_{22}′,

wherein

R_{22} is hydrogen, C_{1-4}alkyl or phenyl, and

R_{22}′ is C_{1-4}-alkyl or phenyl, and is hydrogen,



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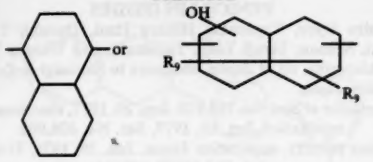
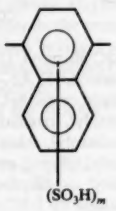
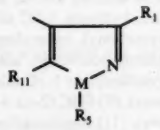


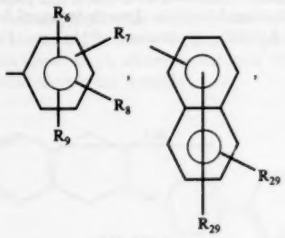
wherein each
R_9 is independently hydrogen or sulfo,
R_{17} is hydrogen, halo, C_{1-4}alkyl or C_{1-4}alkoxy,
R_{18} is hydrogen, C_{1-4}alkyl, C_{1-4}alkoxy, —NH—CO—NHR_{22} or —NH—CO—R_{22}',
wherein R_{22} is hydrogen, C_{1-4}alkyl or phenyl, and
R_{22}' is C_{1-4}-alkyl or phenyl, and
m is 0, 1 or 2, with the proviso that when Y is

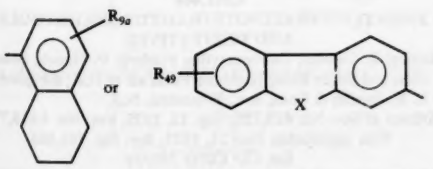


wherein m is 1, the sulfo group is not in the 3- or 5-position relative to the —N=N—K_1 group, and K_1 is



wherein
R_1 is hydrogen, C_{1-4}alkyl, phenyl or —CO—R_2,
wherein
R_2 is hydroxy, —OR_3 or —NHR_4,
wherein
R_3 is C_{1-4}-alkyl, and
R_4 is hydrogen, C_{1-4}alkyl or phenyl,
R_5 is hydrogen,





wherein
R_6 is hydrogen, halo, C_{1-4}alkyl, C_{1-4}alkoxy, cyano, trifluoromethyl, hydroxy or —$SO_2NR_{10}R_{10}'$,
wherein
R_{10} is hydrogen, C_{1-4}alkyl, C_{1-4}-hydroxyalkyl or phenyl, and
R_{10}' is hydrogen or C_{1-4}alkyl,
R_7 is hydrogen, halo, C_{1-4}alkyl, C_{1-4}alkoxy, sulfo or carboxy,
R_8 is hydrogen, halo or C_{1-4}alkyl,
R_9 is hydrogen or sulfo,
R_{9a} is hydrogen or sulfo,
each
R_{29} is independently hydrogen or sulfo,
R_{49} is hydrogen or sulfo, and X is —CH_2— or —O—, and
R_{11} is hydroxy or —NHR_{12},
wherein
R_{12} is hydrogen or —SO_2R_{13},
wherein
R_{13} is C_{1-4}alkyl, phenyl or phenyl substituted by 1 to 3 C_{1-4}alkyls,
with the proviso that the molecule contains 1 or 2 sulfo groups.

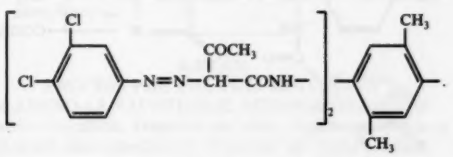
4,081,439

AROMATIC DISAZO PIGMENTS

Stefan Hari, Allschwil, and Karl Ronco, Riehen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 479,964, Jun. 17, 1974, abandoned. This application Aug. 25, 1976, Ser. No. 717,784
Claims priority, application Switzerland, Jun. 22, 1973, 9183/73
Int. Cl.² C09B *33/14*
U.S. Cl. 260—176 **1 Claim**

1. A compound of the formula



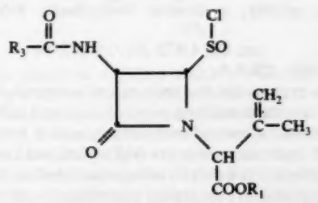
4,081,440

SULFINYL HALIDES AND THEIR PREPARATION FROM PENICILLIN SULFOXIDES

Stjepan Kukolja, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 632,732, Nov. 19, 1975, abandoned, which is a continuation-in-part of Ser. No. 536,273, Dec. 24, 1974, abandoned. This application Apr. 2, 1976, Ser. No. 673,017
Int. Cl.² C07D *205/08, 403/06, 409/06, 413/06*
U.S. Cl. 260—239 A **11 Claims**

1. A compound of the formula



in which R_1 is a carboxylic acid protecting group; and R_3 is
(a) hydrogen, C_1–C_3 alkyl, halomethyl, cyanomethyl, benzyloxy, 4-nitrobenzyloxy, t-butyloxy, 2,2,2-trichloroe-

thoxy, 4-methoxybenzyloxy, 3-(2-chlorophenyl)-5-methylisoxazol-4-yl;

(b) the group R′ in which R′ is phenyl or phenyl substituted with 1 or 2 halogens, protected hydroxy, nitro, cyano, trifluoromethyl, C_1–C_4 alkyl, or C_1–C_4 alkoxy;

(c) a group of the formula $R''—(Q)_m—CH_2—$ in which R″ is R′ as defined above, 1,4-cyclohexadienyl, 2-thienyl, or 3-thienyl; m is 0 or 1; and Q is O or S; subject to the limitation that when m is 1, R″ is R′; or

(d) a group of the formula

in which R″ is as defined above, and W is protected hydroxy or protected amino.

4,081,441

ANTIBACTERIAL AGENTS

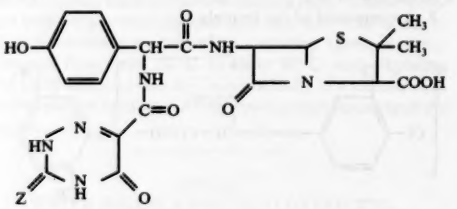
Stephen Richard Baker, Cicero, and Charles Truman Holdrege, Camillus, both of N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Continuation-in-part of Ser. No. 730,091, Oct. 6, 1976, abandoned. This application Apr. 6, 1977, Ser. No. 785,280

Int. Cl.² C07D *499/68*

U.S. Cl. 260—239.1 **23 Claims**

1. The acid of the formula



wherein Z is an oxygen or sulfur atom or a pharmaceutically acceptable salt or physiologically hydrolyzed ester thereof.

4,081,442

PROCESS FOR THE RECOVERY OF ε-CAPROLACTAM FROM A REACTION MIXTURE OF ε-CAPROLACTAM AND SULPHURIC ACID

Willem J. Wassen, Geleen, and Reijer Goettsch, Beek (L), both of Netherlands, assignors to Stamicarbon, B.V., Geleen, Netherlands

Filed Feb. 2, 1977, Ser. No. 765,102

Claims priority, application Netherlands, Feb. 3, 1976, 7601061

Int. Cl.² C07D *201/16, 201/04*

U.S. Cl. 260—239.3 A **4 Claims**

1. In a process for the recovery of ε-caprolactam from a reaction mixture containing ε-caprolactam and sulfuric acid in which at least a part of said sulfuric acid is treated with a source of ammonia to convert said sulfuric acid to an ammonium salt thereof in a melt or an aqueous solution, the improvement comprising (1) contacting said sulfuric acid with a gaseous mixture of ammonia and sulfur dioxide to form said salt; and discharging sulfur dioxide as a gas; (2) separating said lactam from the melt or aqueous solution of said salt; and (3) converting said salt to ammonia and sulfur dioxide.

4,081,443

PENICILLIN OXIDES

Shoichiro Uyeo, Toyonaka; Hikaru Itani, Ibaraki; Tsutomu Aoki, Sennan; Teruji Tsuji, Takatsuki, and Wataru Nagata, Nishinomiya, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

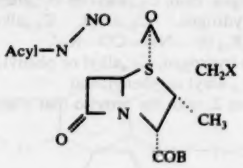
Continuation of Ser. No. 762,823, Jan. 25, 1977, abandoned. This application Jun. 15, 1977, Ser. No. 806,882

Claims priority, application Japan, Jan. 29, 1976, 51-8994

Int. Cl.² C07D *499/44*

U.S. Cl. 260—239.1 **10 Claims**

1. A compound of the formula



wherein Acyl is (1) 1-5C alkanoyl, (2) 2-5C haloalkanoyl, (3) azidoacetyl, (4) cyanoacetyl, (5) Ar—CQQ′—CO— in which Q and Q′ each is hydrogen or methyl, and Ar is furyl, thienyl, pyrryl, oxazolyl, isoxazolyl, oxadiazolyl, oxatriazolyl, thiazolyl, isothiazolyl, thiadiazolyl, thiatriazolyl, pyrazolyl, imidazolyl, triazolyl, tetrazolyl, phenyl, pyridyl, pyrimidyl, pyrazinyl, pyridazinyl, triazinyl or dihydrophenyl, each Ar being unsubstituted or substituted by 1-5C alkyl, 1-5C alkoxy, halogen, trifluoromethyl, hydroxy, cyano, aminomethyl, nitroso or nitro, (6) Ar—G—CQQ′—CO— in which G is oxygen or sulfur, and Ar, Q and Q′ are as defined above, (7) Ar—CHT—CO— in which Ar is as defined above, and T is amino, ammonio, protected amino, hydroxy, 1-3C alkoxy, 1-5C acyloxy, carboxy, 2-10C alkoxycarbonyl, indanyloxycarbonyl, phenoxycarbonyl, dimethylphenoxycarbonyl, azido, cyano, carbamoyl, sulfo, 1-5C alkoxysulfonyl or 1-3C alkoxyphosphonyl, (8) 3-5C 2-syndon-3-alkanoyl, (9) 6-8C (2- or 4-pyridon-1-yl)alkanoyl, (10) 5-aminoadipoyl, (11) 5-aminoadipoyl protected at the amino and/or carboxy, or (12) L—O—CO— in which L is 2,2,2-trichloroethyl, isobornyl, t-butyl, 1-methylcyclohexyl, 2-alkoxy-t-butyl, benzyl, p-nitrobenzyl, p-methoxybenzyl or benzhydryl,

COB is carboxy or protected carboxy,

X is hydrogen, chlorine, bromine, fluorine, formyloxy, acetyloxy, propionyloxy, benzoyloxy, carbonic acid acyloxy, sulfuric acid acyloxy, methoxy, ethoxy, butoxy, phenylthio, nitrophenylthio, tolylthio, 1,3,4-thiadiazolylthio, 2-methyl-1,3,4-thiadiazol-5-ylthio, 2-hydroxymethyl-1,3,4-thiadiazol-5-ylthio, 1-methyltetrazol-5-ylthio, 1,2,3-thiazol-5-ylthio, pyridazin-3-ylthio or 1-oxidopyridin-2-ylthio.

4,081,444

PHENYLPIPERAZINOTETRAHYDRONAPHTHOLS AND DERIVATIVES

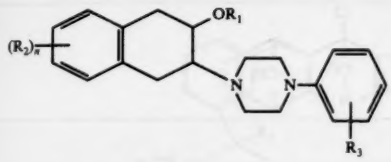
Michael E. Condon, Lawrenceville; Frederic P. Hauck, Somerville, and Joyce Reid, Highland Park, all of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 613,721, Sep. 15, 1975, Pat. No. 4,018,773. This application Jan. 21, 1977, Ser. No. 761,103

Int. Cl.² C07D *295/14*

U.S. Cl. 260—268 PH **24 Claims**

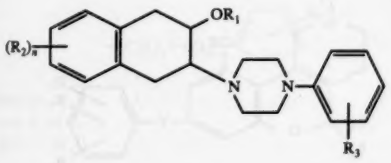
1. A compound having the formula



or a pharmaceutically acceptable salt thereof wherein R_1 is hydrogen; R_2 is

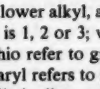
wherein X is alkyl of 1 to 12 carbon atoms or aryl; R_3 is hydrogen, halogen, lower alkyl, alkoxy, alkylthio, trifluoromethyl or nitro; and *n* is 1, 2 or 3; wherein the terms lower alkyl, alkoxy, and alkylthio refer to groups having 1 to 4 carbon atoms and the term aryl refers to phenyl or phenyl monosubstituted with lower alkyl, alkoxy or halogen.

4. A compound having the formula



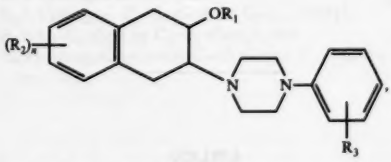
or a pharmaceutically acceptable salt thereof wherein R_1 is

wherein X is alkyl of 1 to 12 carbon atoms or aryl; R_2 is hydrogen, halogen, lower alkyl, hydroxy, alkoxy or

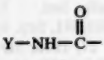


R_3 is hydrogen, halogen, lower alkyl, alkoxy, alkylthio, trifluoromethyl or nitro; and *n* is 1, 2 or 3; wherein the terms lower alkyl, alkoxy, and alkylthio refer to groups having 1 to 4 carbon atoms and the term aryl refers to phenyl or phenyl monosubstituted with lower alkyl, alkoxy or halogen.

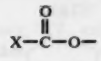
7. A compound having the formula



or a pharmaceutically acceptable salt thereof wherein R_1 is



wherein Y is lower alkyl or aryl; R_2 is hydrogen, halogen, lower alkyl, hydroxy, alkoxy or



wherein X is alkyl of 1 to 12 carbon atoms or aryl; R_3 is hydrogen, halogen, lower alkyl, alkoxy, alkylthio, trifluoromethyl or nitro; and *n* is 1, 2 or 3; wherein the terms lower alkyl, alkoxy, and alkylthio refer to groups having 1 to 4 carbon atoms and the term aryl refers to phenyl or phenyl monosubstituted with lower alkyl, alkoxy or halogen.

4,081,445

CERTAIN BISPIPERAZIDO PHOSPHORUS COMPOUNDS

Johny C. Hermans, Wespelaar, Belgium, assignor to s.a. Texaco Belgium n.v., Brussels, Belgium

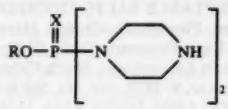
Filed Nov. 3, 1975, Ser. No. 628,288

Claims priority, application United Kingdom, May 21, 1975, 21796/75

Int. Cl.² C07D *295/16, 295/22*

U.S. Cl. 260—268 K **5 Claims**

1.



wherein

X represents an oxygen or sulfur atom or is absent;

and

R represents a hydrogen atom, a C_1–C_{18} alkyl group, or a phenyl group.

4,081,446

PROCESS FOR THE PREPARATION OF 4-AMINO-1,8-NAPHTHALIC ACID-N-ARYLIMIDES

Theodor Papenfuhs, Frankfurt am Main, Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

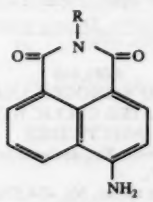
Continuation of Ser. No. 572,753, Apr. 29, 1975, abandoned. This application Oct. 4, 1976, Ser. No. 728,923

Claims priority, application Germany, May 15, 1974, 2423546

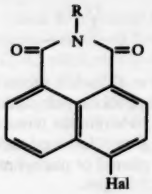
Int. Cl.² C07D *221/14*

U.S. Cl. 260—281 N **5 Claims**

1. A process for the preparation of a compound of the formula



wherein R is phenyl or naphthyl which are unsubstituted or substituted by 1 to 3 substituents selected from alkyl or alkoxy of 1 to 6 carbon atoms each, cyano, alkanoyl of 1 to 4 carbon atoms, benzoyl, benzenesulfonyl, toluenesulfonyl, alkylsulfonyl of 1 to 4 carbon atoms, hydroxy, trifluoromethyl, carboalkoxy of 1 to 4 carbon atoms in the alkyl moiety, alkanoylamino of 1 to 4 carbon atoms, benzoylamino, alkylsulfonylamino of 1 to 4 carbon atoms, benzenesulfonylamino, toluene-sulfonylamino, ureido, carbamoyl, sulfamoyl, amino, mono- or dialkylamino with alkyl moieties of 1 to 4 carbon atoms each, chlorine or bromine which comprises reacting a compound of the formula



wherein R is as defined above and Hal is halogen, with ammonia under pressure in an anhydrous polar organic solvent at a temperature of from 150° to 200° C, said solvent being an alkanol of 1 to 6 carbon atoms, dimethylformamide, tetrahydrofuran, dioxan or a mono- or diether or ethylene glycol with alkanols of 1 to 4 carbon atoms.

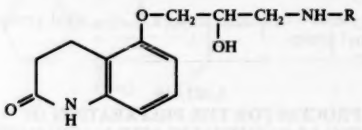
4,081,447

5-[2-HYDROXY-3-(3,4-DIMETHOXY PHENETHYLAMINO)]-PROPOXY-3,4-DIHYDRO CARBOSTYRIL AND PHARMACEUTICALLY ACCEPTABLE SALTS THEREOF

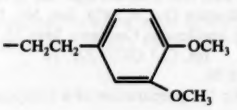
Raj Nandan Prasad, Pierrefonds, Canada; Herman Hal Stein, Skokie, Ill., and Karin Rosemarie Tietje, Philipsburg, Canada, assignors to Abbott Laboratories, North Chicago, Ill.

Filed Apr. 9, 1975, Ser. No. 566,600
Int. Cl.[2] C07D *215/22;* A61K *31/47*
U.S. Cl. 260—288 R **2 Claims**

1. A compound of the formula



wherein R is



and the physiologically compatible acid addition salts thereof.

4,081,448

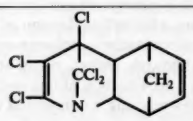
BRIDGEHEAD NITROGEN ANALOGS OF POLY-CHLORINATED CYCLIC HYDROCARBON INSECTICIDES

John Lui Wong, Louisville, Ky., assignor to Research Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 454,576, Mar. 25, 1974, abandoned. This application Mar. 31, 1976, Ser. No. 672,322
Int. Cl.[2] C07D *221/22, 491/08*
U.S. Cl. 260—290 HL **3 Claims**

1. A compound having a structural formula selected from the group consisting of:

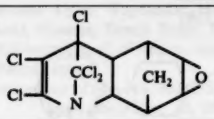
a)



and

-continued

b)



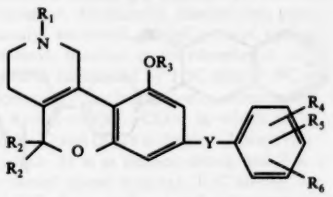
4,081,449

HETEROCYCLIC ESTERS OF ALKYLPHENYL BENZOPYRANOPYRIDINES

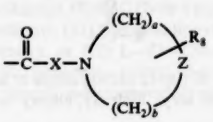
Martin Winn, Waukegan, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

Filed Apr. 5, 1973, Ser. No. 348,367
Int. Cl.[2] C07D *491/04*
U.S. Cl. 260—293.58 **7 Claims**

1. A compound of the formula:



wherein R_1 is loweralkynyl; R_2 is methyl; R_3 is



wherein X is a straight or branched chain alkylene group having from one to eight carbon atoms, a is an integer from 1 to 4, b is an integer from 1 to 4 and Z is CH_2, O, S or NR_7, with R_7 being hydrogen or loweralkyl, with the limitation that when Z is O, S or NR_7, the sum of a and b is 3 or 4; and R_8 is hydrogen or loweralkyl; Y is a straight or branched chain alkylene group having from one to ten carbon atoms; and each R_4 and R_5 and R_6 are the same or different members of the group consisting of hydrogen, halo, trifluoromethyl or loweralkyl; and the pharmaceutically acceptable acid addition salts thereof.

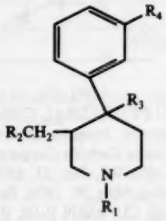
4,081,450

1,3,4-TRISUBSTITUTED-4-ARYLPIPERIDINES AND THEIR PREPARATION

Dennis M. Zimmerman, Mooresville, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

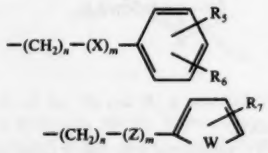
Continuation of Ser. No. 503,581, Sep. 6, 1974, abandoned. This application May 27, 1976, Ser. No. 690,767
Int. Cl.[2] C07D *419/06*
U.S. Cl. 260—293.67 **7 Claims**

1. The compound of the formula



wherein:

R_1 is C_1–C_8 alkyl, C_3–C_8 alkenyl, C_3- C_8 alkynyl, C_3–C_6 cycloalkyl-C_1-C_3alkyl,



wherein:

n is 1, or 2,

m is O or 1;

CH=CH, S, O or NR_8, wherein:

R_8 is hydrogen, C_1–C_4 alkyl or C_1–C_4 alkanoyl;

or CH=Ch;

W is O or S;

R_5 is C_1–C_3 alkylthio, nitro, amino, trifluoromethyl, hydroxy, or R_6;

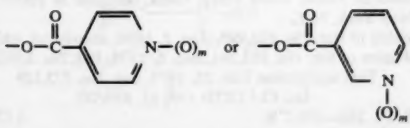
R_6 is hydrogen, C_1–C_3 alkyl, C_1–C_3 alkoxy, or halogen;

R_7 is hydrogen or methyl;

R_2 is hydrogen, C_1–C_4 alkyl, or C_2–C_6 alkenyl;

R_3 is C_1–C_4 alkyl or C_2–C_6 alkenyl; and

R_4 is hydrogen, hydroxy, C_1–C_3 alkoxy, C_1–C_{12} alkanoyloxy, or



and the pharmaceutically acceptable salts thereof.

4,081,451

PROCESS FOR PREPARING 2-HALOGENO NICOTINIC ACIDS

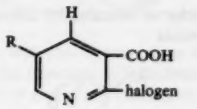
Joseph Mayer, New York, N.Y., assignor to Schering Corporation, Kenilworth, N.J.

Continuation-in-part of Ser. No. 558,531, Mar. 20, 1975, abandoned, which is a continuation-in-part of Ser. No. 430,965, Jan. 4, 1974, abandoned, which is a continuation-in-part of Ser. No. 298,195, Oct. 17, 1972, abandoned, which is a continuation of Ser. No. 150,808, Jun. 7, 1971, abandoned, which is a continuation-in-part of Ser. No. 845,907, Jul. 29, 1969, abandoned. This application Apr. 4, 1977, Ser. No. 784,095

Int. Cl.[2] C07D *213/55*

U.S. Cl. 260—295.5 R **18 Claims**

1. A process for the preparation of a 5-R-2-halogeno nicotinic acid having the formula:



wherein R is a member of the group consisting of hydrogen, bromo, alkyl, phenyl and benzyl which comprises the following steps:

(a) hydrolyzing an R-substituted-3-cyano-2-pyridone to obtain an R-substituted-2-hydroxy-nicotinic acid,

(b) reacting said R-substituted-2-hydroxy-nicotinic acid with a phosphorous oxyhalide and,

(c) hydrolyzing the so-produced R-substituted-2-halogeno-nicotinoyl halide to the corresponding R-substituted-2-halogeno-nicotinic acid.

4,081,452

NOVEL DERIVATIVES OF 4H-S-TRIAZOLO[4,3-α][1,4]BENZODIAZEPINES

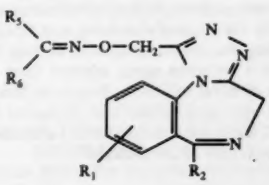
Jackson B. Hester, Jr., Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 666,902, Mar. 15, 1976, Pat. No. 4,009,175. This application Aug. 12, 1976, Ser. No. 713,925

Int. Cl.[2] C07D *487/04*

U.S. Cl. 260—296 T **8 Claims**

1. A compound of the formula VI:



VI

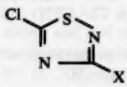
wherein R_5 and R_6 are hydrogen, or alkyl of 1 to 3 carbon atoms, inclusive; R_1 is hydrogen, fluoro, chloro, bromo, nitro, trifluoromethyl, or alkylthio in which the alkyl moiety is of 1 to 3 carbon atoms, inclusive; R_2 is phenyl, o-chlorophenyl, o-fluorophenyl, 2,6-difluorophenyl, and 2-pyridyl; and the pharmacologically acceptable acid addition salts thereof.

4,081,453
CERTAIN 3,5-DIHALO-1,2,4-THIADIAZOLE PREPARATIONS

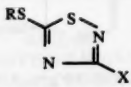
Gary L. Smith, Lewisburg, and Dennis Eugene Reese, Marysville, both of Ohio, assignors to The O. M. Scott & Sons Company, Marysville, Ohio

Continuation-in-part of Ser. No. 198,399, Nov. 12, 1971, abandoned. This application Apr. 5, 1973, Ser. No. 348,044
Int. Cl.[2] C07D *285/08*
U.S. Cl. 260—302 D 6 Claims

1. The process of making a compound of the formula

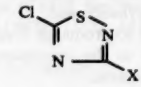


where X is chlorine or bromine by displacing RS of a compound of the formula

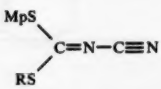


where X is as aforesaid and R is C_1–C_4 alkyl or benzyl by Cl using gaseous chlorine as a chlorinating agent.

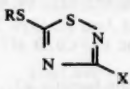
4. The process of making a compound of the formula



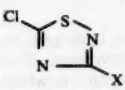
where X is chlorine or bromine by reacting a cyanodithiomidocarbonate of the formula



where M is an alkali or alkaline earth metal; *p* is 1 when M has a valence of 1 and ½ when M has a valence of 2; and R is C_1–C_4 alkyl or benzyl with a halogenting agent capable of introducing chlorine or bromine and selected from the group consisting of chlorine, bromine, thionyl chloride, trichloromethane sulfenyl chloride and phosphorus pentachloride to produce a 1,2,4-thiadiazole of the formula

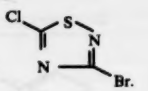


where R and X are as aforesaid; removing contaminants from the thiadiazole by the steps of dissolving said thiadiazole in a solvent, extracting the resulting solution of said thiadiazole with a base and a reducing agent selected from the group consisting of alkali metal sulfites, hydrogen sulfites, and alkaline earth metal hydrogen sulfites; and displacing RS of said thiadiazole by Cl using gaseous chlorine as a chlorinating agent to produce a compound of the formula



where X is as aforesaid.

6. The compound of the formula

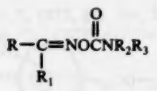


4,081,454
CARBAMIC PESTICIDAL COMPOSITIONS

Themistocles Damasceno Joaquim D'Silva, S. Charleston, W. Va., assignor to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 483,882, Jun. 27, 1974, Pat. No. 4,029,688. This application May 20, 1976, Ser. No. 688,221
Int. Cl.[2] A01N *9/06, 9/20*
U.S. Cl. 424—304 15 Claims

1. An insecticide, miticide or nematocide composition comprising an acceptable carrier and an insecticidally, miticidally or nematocidally effective amount of a compound of the formula:



wherein

R is:

A. lower alkyl;

B. lower alkyl substituted with one or more lower alkoxy, lower alkylthio, lower alkylsulfinyl, lower alkylsulfonyl, phenylthio, phenylsulfinyl, phenylsulfonyl or $R_4CON(R_5)$-, all of which may be substituted with one or more cyano, nitro, azido, chloro, bromo or fluoro substituents;

R_1 is:

A. hydrogen, chlorine, bromine, fluorine, cyano;

B. alkyl having from 1 to 4 carbon atoms, lower alkylthio, lower alkoxy, lower carboalkoxyalkylthio, lower alkylthioalkyl, all of which may either be unsubstituted or substituted with one or more chloro, bromo, fluoro cyano or nitro groups;

R_2 is: lower alkyl or lower alkyl substituted with one or more chloro, bromo, fluoro, nitro, cyano, lower alkoxy or lower alkyl groups;

R_3 is: perhalomethanesulfenyl or perhaloethanesulfenyl wherein halogen substituents are chloro, bromo or fluoro;

R_4 and R_5 are individually hydrogen or lower alkyl; with the proviso that:

A. When R is alkyl, R_1 is substituted lower alkyl, substituted lower alkylthio, unsubstituted or substituted lower alkoxy, unsubstituted or substituted lower carboalkoxyalkylthio or unsubstituted or substituted lower alkylthioalkyl;

B. When R_1 is hydrogen, R is other than unsubstituted lower alkylthioalkyl; and

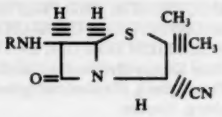
C. At least one of the groups R, R_1 and R_2 is a group including one or more cyano substituents when R_1 is other than cyano.

4,081,455
6-AMINO-2,2-DIMETHYL-3-CYANOPENAMS

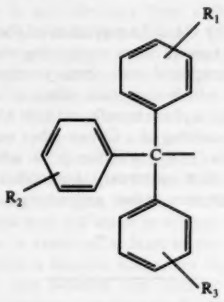
Donald E. Kuhla, Gales Ferry, Conn., assignor to Pfizer Inc., New York, N.Y.

Division of Ser. No. 691,999, Jun. 2, 1976, abandoned, which is a division of Ser. No. 503,281, Sep. 5, 1974, Pat. No. 3,992,394. This application Feb. 25, 1977, Ser. No. 772,126
Int. Cl.[2] C07D *499/42, 499/00*
U.S. Cl. 260—306.7 R 4 Claims

1. A compound selected from the group consisting of (a) those of the formula



wherein R is selected from the group consisting of hydrogen and the group of the formula



wherein each of R_1, R_2 and R_3 is selected from the group consisting of hydrogen, chloro, bromo, fluoro, alkyl having from 1 to 4 carbon atoms, alkoxy having from 1 to 4 carbon atoms and phenyl and (b) the acid addition salts of those compounds wherein R is hydrogen.

4,081,456

BIS-LACTAM DERIVATIVES

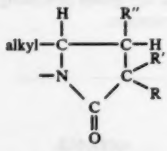
El Ahmadi I. Heiba, Princeton, and Ralph M. Dessau, Edison Township, Middlesex County, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 336,564, Feb. 28, 1973, abandoned, which is a continuation-in-part of Ser. No. 799,939, Feb. 17, 1969, abandoned, which is a continuation-in-part of Ser. No. 714,447, Mar. 20, 1968, abandoned. This application Feb. 20, 1976, Ser. No. 659,803

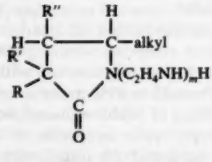
Int. Cl.[2] C07D *403/06, 403/12*

U.S. Cl. 260—326.25 **10 Claims**

1. A compound having the structure:



wherein the alkyl group has from 16 to 100 carbon atoms; R, R′ are R″ are individually selected from the group consisting of hydrogen, methyl and ethyl; and —N is the amino nitrogen of a lactam polyamine having the structure



wherein *m* is an integer of 1 to 10 and R, R′ and R″ are individually selected as previously defined.

4,081,457

PRECURSORS OF HETEROTHIENOBENZOXEPIN ACETIC ACIDS

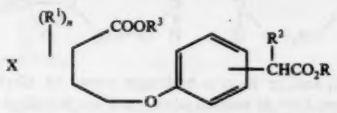
Arthur Raymond McFadden, East Brunswick, and Daniel Eugene Aultz, Middlesex, both of N.J., assignors to American Hoechst Corporation, Bridgewater, N.J.

Division of Ser. No. 607,926, Aug. 26, 1975, Pat. No. 4,025,640. This application Apr. 19, 1977, Ser. No. 788,753

Int. Cl.[2] C07D *333/24;* **A01N** *9/00*

U.S. Cl. 260—332.2 C **4 Claims**

1. A compound of the formula



wherein X together with the carbon atoms to which it is attached is a thieno ring structure; R is hydrogen or straight or branched chain alkyl of from 1 to 5 carbon atoms; R^1 is alkyl of 1 to 4 carbon atoms; R^2 is hydrogen or methyl; R^3 is hydrogen or alkyl of 1 to 4 carbon atoms; *n* is the integer 0, 1 or 2; and salts thereof prepared from pharmaceutically acceptable bases.

4,081,458

ANTI-ANDROGEN COMPOUNDS

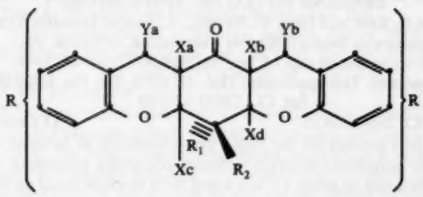
Michael E. Flaugh, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed May 26, 1977, Ser. No. 800,673

Int. Cl.[2] C07D *493/04*

U.S. Cl. 260—335 **35 Claims**

1. A compound of the formula



in which each R is hydrogen, C_1–C_4 alkyl, C_1–C_4 alkoxy, hydroxy, cyano, or halo, and both R groups are identical and are symmetrically located; R_1 is C_1–C_3 alkyl and R_2 is methyl, or R_1 and R_2 taken together are $(CH_2—)_n$ in which *n* is an integer from 4 to 6; and (1) X_c and X_d are hydrogen, and the combination of X_a and Y_a and of X_b and Y_b each represents a double bond, subject to the limitation that, when R_1 is C_1–C_3 alkyl and is other than methyl, X_c, X_d, and R_1 are all in an α-configuration; or (2) X_a, X_b, X_c, X_d, Y_a, and Y_b are hydrogen, subject to the limitation that both X_c and X_d are in a α-configuration, both X_a and X_b are in an α-configuration or in a β-configuration, and, R_1, when it is C_1–C_3 alkyl, is in an α-configuration.

4,081,459

TRIOXA-1, 5, 7 SPIRO [2,5] OCTANES AND THEIR METHOD OF PREPARATION

Henri Mathais, Sainte Foy les Lyon, and Francis Weiss, Pierre-Benite, both of France, assignors to Produits Chimiques Ugine Kuhlmann, Paris, France

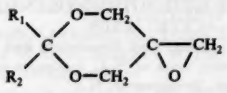
Continuation of Ser. No. 88,508, Nov. 10, 1970, abandoned. This application Mar. 29, 1976, Ser. No. 671,041

Claims priority, application France, Nov. 14, 1969, 6939212

Int. Cl.[2] C07D *319/04*

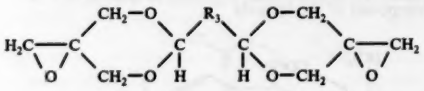
U.S. Cl. 260—340.7 **9 Claims**

1. Trioxa-1, 5, 7 spiro [2.5] conforming to formula (I):



(I)

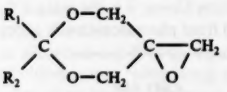
and bis(trioxa-1, 5, 7 spiro [2.5] octanes) conforming to formula (II):



(II)

wherein R_1 and/or R_2 is a hydrogen atom, an alkyl group having from 1 to 18 carbon atoms and a cycloalkyl having from 3 to 18 carbons and R_3 is an alkylene group of 1 to 12 carbon atoms, a phenylene group or a bond.

4. Trioxa-1, 5, 7 spiro [2.5] octanes conforming to formula (I):



(I)

wherein R_1 and R_2 together are propylene, butylene, pentylene, methyl-pentylene, heptylene, undecylene, 1-pentylene, and 4,9-undecadienylene.

4,081,460

PROCESS FOR THE VAPOR PHASE OXIDATION OF BENZENE TO MALEIC ANHYDRIDES

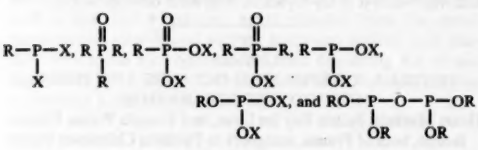
Ralph O. Kerr, and Gabe W. Strybos, Jr., both of Houston, Tex., assignors to Denka Chemical Corporation, Houston, Tex.

Continuation-in-part of Ser. No. 563,687, Mar. 31, 1975, abandoned. This application Dec. 12, 1975, Ser. No. 640,075

Int. Cl.[2] C07D *307/60*

U.S. Cl. 260—346.75 **13 Claims**

1. In a process for the vapor phase oxidation of benzene to maleic anhydride wherein a stream consisting essentially of said benzene, at about 1.1 to 1.6 mol % of benzene based on the total gaseous stream and a flow rate of 50 to 200 grams of benzene per hour and oxygen, is contacted at a temperature in the range of 340°–500° C with a fixed bed vanadium — molybdenum — oxygen catalyst, having an atomic ratio of molybdenum to vanadium in the range of 0.05 to 0.95:1 and containing less than 25 percent by weight of other components based on the total weight of molybdenum and vanadium, there being an exotherm of reaction in said catalyst bed and wherein said catalyst gradually decreases in activity, the improvement comprising adding to said stream a volatilizable compound of a phosphorus halide or an organo-phosphorus compound selected from the group consisting of



wherein R is phenyl or an alkyl radical of one to 6 carbon atoms and X is H or R, to contact said catalyst in an amount to deactivate only the portion of said catalyst bed containing the exotherm of reaction which was present in said catalyst bed prior to the addition of said phosphorus compound, thereby moving said exotherm down stream into said catalyst bed.

4,081,461

ACYLATION PROCESS FOR THE PREPARATION OF PHENOLIC N-DISUBSTITUTED CARBAMATE ESTERS, AND ION PAIR SOLUTION FOR USE IN THE PROCESS

Hans Jacob Fex; Sten Krister Kristensson, and Anders Robert Stamvik, all of Helsingborg, Sweden, assignors to Aktiebolaget Leo, Helsingborg, Sweden

Filed Jun. 24, 1976, Ser. No. 699,214

Claims priority, application United Kingdom, Jul. 7, 1975, 28604/75; Mar. 17, 1976, 10824/76

Int. Cl.[2] C07C *125/06*

U.S. Cl. 260—397.4 **32 Claims**

1. In a process for the carbamoylation of phenolic hydroxy groups to form carbamate esters, comprising reacting in liquid phase a phenolic compound, and a tertiary carbamoyl chloride, the improvement which comprises using an aqueous alkali metal hydroxide and a phase transfer catalyst which is selected from the group consisting of a Crown-ether and a compound having the formula Q^+X^-; wherein Q^+ is selected from the group consisting of a quaternary ammonium cation and a quaternary phosphonium cation; and wherein X^- is an inorganic anion.

4,081,462

C_{22}-CYCLOALIPHATIC TRICARBOXYLIC FATTY ACID SOAPS

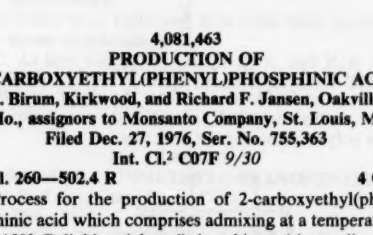
John R. Powers, Mount Pleasant, and Frances C. Miller, Charleston, both of S.C., assignors to Westvaco Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 622,254, Oct. 14, 1975, abandoned. This application Jan. 19, 1977, Ser. No. 760,566

Int. Cl.[2] C07C *61/38;* C11D *9/00;* C07C *87/10, 91/06*

U.S. Cl. 260—501.1 **5 Claims**

1. A cycloaliphatic tricarboxylic fatty acid soap of the formula



wherein *x* and *y* are integers from 3 to 9, *x* and *y* together equal 12, M is selected from the group consisting of sodium, potassium, lithium and ammonium.

4,081,463

PRODUCTION OF 2-CARBOXYETHYL(PHENYL)PHOSPHINIC ACID

Gail H. Birum, Kirkwood, and Richard F. Jansen, Oakville, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Dec. 27, 1976, Ser. No. 755,363

Int. Cl.[2] C07F *9/30*

U.S. Cl. 260—502.4 R **4 Claims**

1. Process for the production of 2-carboxyethyl(phenyl)-phosphinic acid which comprises admixing at a temperature of 80° to 150° C dichloro(phenyl)phosphine with acrylic acid in the proportion of from 25 to 45% molar excess of the acrylic acid to obtain a mixture of 3-(chlorophenylphosphinyl)propionyl chloride, and the cyclic anhydride of 2-carboxyethyl(-phenyl)phosphinic acid, and the mixed anhydride of acrylic acid with 3-chlorocarbonylethyl(phenyl)phosphinic acid, and thereafter hydrolyzing the said mixture with water.

4,081,464

ISO- OR TEREPHTHALIC ACID PRODUCTION IN AND RECOVERY FROM BENZOIC ACID-WATER SOLVENT SYSTEM

David R. Marsh, Lisle, and Leonard E. Stark, Bristol, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Jul. 26, 1976, Ser. No. 708,360
Int. Cl.[2] C07C *51/42*
U.S. Cl. 260—524 R 7 Claims

1. In a continuous process for iso- or terephthalic acid product production in and recovery from a benzoic acid-water solvent system wherein m- or p-xylene is oxidized with air in the presence of catalysis provided by manganese, cobalt or cobalt and manganese and a source of bromine and a liquid phase of said solvent system at a temperature within the range of from 175° to 235° C. and a constant gauge pressure within the range of 7 to 21 kg/cm^2 in a stirred reaction zone to produce a suspension of crystalline phthalic acid product in said solvent system as fluid oxidation zone effluent and a gas-vapor mixture containing nitrogen, oxygen, oxides of carbon and vapors of benzoic acid and water as exhaust effluent; wherein heat of reaction is removed at least in part by cooling said exhaust to provide a benzoic acid-water liquid reflux to the oxidation zone; and wherein said phthalic acid product is separated as a crystalline mass from the fluid oxidation effluent, washed to remove mother liquor and dried; the improvements comprising, conducting the m- or p-xylene oxidation in the presence of from 2 to 6 weight parts of solvent system consisting essentially of 90–97 weight percent benzoic acid and 10–3 weight percent water for each weight part of xylene and at a substantially constant oxidation zone temperature within said temperature range controlled by varying the rate of water condensate returned to the oxidation zone inversely with respect to change required in oxidation zone temperature; evaporating water from fluid effluent from the oxidation zone under conditions maintaining benzoic acid in the liquid phase; separating the suspended crystalline product mass from the water-free oxidation zone fluid effluent; and washing the separated crystalline product mass at a temperature of from 122° up to 135° C first with liquid benzoic acid and then with xylene corresponding to the product.

4,081,465

METHOD FOR THE OXIDATIVE DEHYDROGENATION OF ISOBUTYRIC ACID

Wilhelm Gruber, Darmstadt, and Guenter Schroeder, Ober-Ramstadt, both of Germany, assignors to Rohm GmbH, Darmstadt, Germany

Filed Oct. 18, 1976, Ser. No. 733,326
Claims priority, application Germany, Nov. 13, 1975, 2550979
Int. Cl.[2] C07C *51/24*
U.S. Cl. 260—526 N 3 Claims

1. In a method for the oxidative dehydrogenation of isobutyric acid in the gas phase, in the presence of oxygen and water vapor at a temperature from 300° C. – 500° C., and in the presence of a solid catalyst, the improvement wherein said catalyst consists essentially of at least one member selected from the group consisting of elemental molybdenum, elemental tungsten, molybdenum trioxide, and tungsten trioxide.

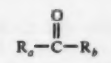
4,081,466

CATALYTIC REACTION OF HEXAFLUOROPROPYLENE EPOXIDE WITH A KETONE OR ACID FLUORIDE

Paul Raphael Resnick, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 564,483, Apr. 2, 1975, abandoned. This application Jun. 18, 1976, Ser. No. 697,629
Int. Cl.[2] C07C *51/58*
U.S. Cl. 260—544 F 6 Claims

1. In a process for the catalytic reaction of hexafluoropropylene epoxide with a compound of the formula



wherein R_a and R_b each independently of the other is fluorine, a fluoroalkyl group of one to 14 carbon atoms, a sulfonyl substituted fluoroalkyl group of one to 14 carbon atoms, a fluoroalkoxy group of one to 14 carbon atoms, a sulfonyl substituted fluoroalkoxy group of one to 14 carbon atoms, a fluoroalkoxyalkyl group of one to 14 carbon atoms and one to six oxygen atoms or a sulfonyl substituted fluoroalkoxyalkyl radical of one to 14 carbon atoms and one to six oxygen atoms, the improvement comprising employing a catalyst having the formula $R_1R_2R_3S^+X^-$, wherein R_1, R_2 and R_3 each independently of the other denotes an alkyl group of one to 20 carbon atoms and X, is selected from the group consisting of F, $(CH_3)_3SiF_2$, Cl, Br, I, CN, NCO, NCS, NO_2 and N_3.

4,081,467

CATALYTIC DIMERIZATION OF HEXAFLUOROPROPYLENE EPOXIDE TO FORM PERFLUORO-2-(N-PROPOXY) PROPIONYL FLUORIDE

Paul Raphael Resnick, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 564,484, Apr. 2, 1975, abandoned. This application Jun. 18, 1976, Ser. No. 697,630
Int. Cl.[2] C07C *51/58*
U.S. Cl. 260—544 F 6 Claims

1. In a process for the catalytic dimerization of hexafluoropropylene epoxide to form perfluoro-2-(n-propoxy) propionyl fluoride, the improvement comprising employing a catalyst having the formula $R_1R_2R_3S^+X_1^-$ wherein R_1, R_2 and R_3 each independently of the other is an alkyl group of one to twenty carbon atoms and X_1 is selected from the group consisting of F, $(CH_3)_3SiF_2$, Cl, Br, I, CN, NCO, NCS, NO_2 and N_3.

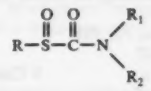
4,081,468

THIOLCARBAMATE SULFOXIDES STABILIZED WITH ACETYLENIC COMPOUNDS

Don Robert Baker, Orinda; Francis Harry Walker, Mill Valley, and Chien Knei Tseng, El Cerrito, all of Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Filed Sep. 8, 1976, Ser. No. 721,248
Int. Cl.[2] C07C *147/14*; A01N *9/14*
U.S. Cl. 260—551 R 72 Claims

1. A composition of matter comprising a thiolcarbamate sulfoxide of the formula



wherein R is selected from the group consisting of lower alkyl, halo lower alkyl, lower alkenyl, and alkoxy lower alkenyl; and R_1 and R_2 are independently selected from the group consisting of lower alkyl, cycloalkyl having 3–8 carbon atoms, lower alkylcycloalkyl, lower alkenyl, and lower alkynyl and a stabilizing amount of an acetylenic compound having the formula

$R_3—C\equiv C—R_4$

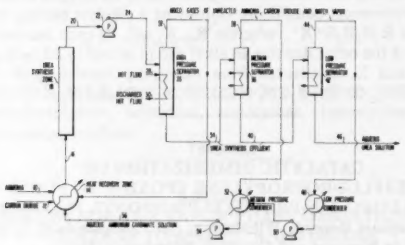
wherein R_3 is selected from the group consisting of hydroxy, hydroxy alkyl, hydroxy alkenyl, hydroxy alkynyl, hydroxy substituted cycloalkyl, hydroxy substituted phenyl, hydroxy substituted phenalkyl, amino substituted alkyl and alkyl substituted by the group —O—C(O)-alkyl and R_4 is selected from the group consisting of hydrogen, alkyl, alkenyl, alkynyl, cycloalkyl, phenyl, phenalkyl, hydroxy alkyl, hydroxy alkenyl, hydroxy cycloalkyl, hydroxy substituted phenyl, hydroxy substituted phenalkyl, amino alkyl, and alkyl substituted by the group —O—C(O)-alkyl.

4,081,469

PROCESS FOR SEPARATING AND RECOVERING UNREACTED MATERIALS IN UREA SYNTHESIS

Hiroshi Ono, Fujisawa, and Shigeru Inoue, Kamakura, both of Japan, assignors to Mitsui Toatsu Chemicals, Tokyo, Japan

Filed Aug. 30, 1976, Ser. No. 718,562
Claims priority, application Japan, Sep. 22, 1975, 50-113709
Int. Cl.[2] C07C *126/02*
U.S. Cl. 260—555 A **15 Claims**



1. A process for treating unreacted ammonium carbamate and excess ammonia contained in a urea synthesis effluent which comprises reacting in a urea synthesis zone carbon dioxide with a stoichiometric excess of ammonia at urea synthesis pressures and temperatures to form said urea synthesis effluent, the mol ratio of said ammonia to said carbon dioxide being in the same range of 5:1 to 12:1, pressurizing said urea synthesis effluent from said urea synthesis zone to a pressure higher than said urea synthesis pressure, heating to a temperature higher than said urea synthesis temperature said pressurized urea synthesis effluent in a separation zone to separate therefrom said unreacted ammonium carbamate and said excess ammonia in the form of a mixed gas of ammonia and carbon dioxide, and recycling said mixed gas having the pressure higher than said urea synthesis pressure to said urea synthesis zone.

4,081,470

MANUFACTURE OF POLYENE COMPOUNDS VIA A WITTIG REACTION IN A TWO PHASE SOLVENT SYSTEM

Kuno Schleich, Zollikerberg, and Hansjörg Stoller, Reinach, both of Switzerland, assignors to Hoffman-La Roche Inc., Nutley, N.J.

Filed Aug. 4, 1976, Ser. No. 711,765
Int. Cl.[2] C11C *3/02*
U.S. Cl. 260—410.9 R **9 Claims**

1. In a process for the preparation of polyene compounds containing a 3,7-dimethyl-nona-1,3,5,7-tetraen-1-yl group by reacting, via a Wittig synthesis, triarylphosphonium salts with aldehydes, the improvement which comprises carrying out the Wittig reaction in a two-phase, aqueous-organic solvent system, the organic phase consisting of a hydrocarbon or a chlorinated hydrocarbon which is immiscible with water and the volume ratio between the organic phase and water being from about 10:1 to about 1:20.

8. The process of claim 1 for the preparation of 9-(4-methoxy-2,3,6-trimethyl-phenyl)-3,7-dimethyl-nona-2,4,6,8-tetraene-1-acid ethyl ester wherein 5-(4-methoxy-2,3,6-trimethylphenyl-3-methyl-penta-2,4-diene-1-triphenylphosphonium chloride is reacted with oxosenecioic acid ethyl ester.

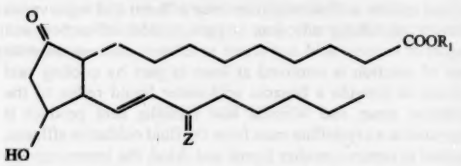
4,081,471

2A,2B-DIHOMO-15-ALKYL-PGE$_1$ ANALOGS

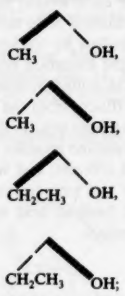
Gilbert A. Youngdale, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 511,220, Oct. 2, 1974, Pat. No. 3,974,195.
This application Mar. 3, 1976, Ser. No. 663,564
Int. Cl.[2] C11C *3/02*
U.S. Cl. 260—410.9 R **7 Claims**

1. An optically active compound of the formula:



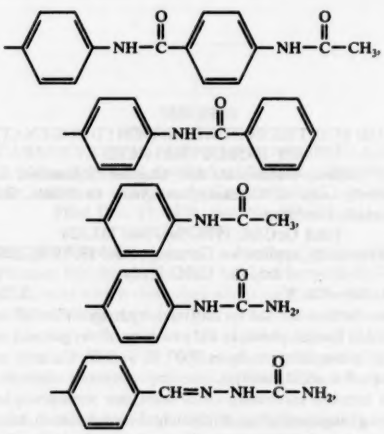
wherein Z is



or

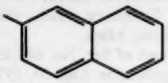
and

wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive,



or

-continued



or pharmacologically acceptable salts thereof when R_1 is hydrogen.

4,081,472
PROCESS FOR PREPARATION OF AROMATIC ISOCYANATES

Ryuichirou Tsumura, Yokohama; Usaji Takaki, Kamakura, and Takeshi Abe, Tokyo, all of Japan, assignors to Mitsui Toatsu Chemicals Inc., Tokyo, Japan

Filed Aug. 5, 1976, Ser. No. 711,823
Claims priority, application Japan, Aug. 7, 1975, 50-96056
Int. Cl.[2] C07C *118/00*
U.S. Cl. 260—453 P **7 Claims**

1. A process for the preparation of aromatic isocyanates, comprising the steps of: providing an aromatic carbamate of the general formula:

$$R(NHCO_2R')n$$

wherein R is selected from monovalent and divalent aromatic groups with at most 32 carbon atoms, R' is selected from monovalent aliphatic, alicyclic and aromatic groups with at most 8 carbon atoms, and *n* is an integer selected from 1 and 2; contacting said aromatic carbamate at a temperature of 150°–350° C and subatmospheric pressure with an solution of at least one compound selected from the group consisting of, carboxylates; alcoholates; phenolates; sulfonates; chelates with a chelating agent selected from β-diketones, ketoesters, hydroxyaldehydes, amino acids and hydroxyacids; carbamates; thio-and dithiocarbamates; hydroxides; nitrates; phosphates; borates; complexes with a neutral ligand selected from amines, phosphines, phosphites, nitriles and amides; and oxides of at least one metal selected from the group consisting of copper, zinc, aluminum, tin, titanium, vanadium, iron, cobalt and nickel as catalyst, said catalyst being dissolved in an inert solvent having a boiling point of at least 200° C in a metal concentration of at least 0.001% by weight based on said solvent, to effect the pyrolysis of said aromatic carbamate and to obtain vapors of aromatic isocyanate and by-product vapors; thereafter subjecting all of said vapors to fractional condensation under subatmospheric pressure to collect said aromatic isocyanate separately from said by-product vapors.

4,081,473
FLUOROALKYLENEETHER DIFUNCTIONAL COMPOUNDS

Christ Tamborski, Dayton, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Division of Ser. No. 610,520, Sep. 4, 1975, Pat. No. 4,011,255. This application Oct. 29, 1976, Ser. No. 737,120
Int. Cl.[2] C07C *119/00*
U.S. Cl. 260—453 RW **5 Claims**

1. A fluoroalkylether difunctional compound having the following formula:

$$CH_3O(NH)C\text{-}R_f\text{-}C(NH)OCH_3,$$

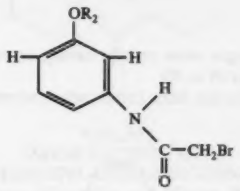
wherein R_f is $(CF_2)_4O(CF_2)_4O(CF_2)_4$ or $Y[CF(CF_3)CF_2O]_n(CF_2)_4[OCF_2CF(CF_3)]_nY$, where each Y is $(CF_2)_4O$— or $CF(CF_3)OCF_2CF_2O$—, and *n* is an integer from 1 to 5, inclusive.

4,081,474
SULFONYLOXY BROMOACETANILIDES AND THEIR UTILITY AS BIOCIDES

Don R. Baker, Orinda, and Eugene G. Teach, El Cerrito, both of Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Continuation of Ser. No. 612,404, Sep. 11, 1975, abandoned, which is a continuation of Ser. No. 470,504, May 16, 1974, abandoned, which is a division of Ser. No. 288,235, Sep. 11, 1972, Pat. No. 3,836,564, which is a continuation-in-part of Ser. No. 127,775, Mar. 24, 1971, abandoned, which is a division of Ser. No. 806,717, Mar. 12, 1969, abandoned. This application Aug. 30, 1976, Ser. No. 718,997
Int. Cl.[2] C07C *143/68*
U.S. Cl. 260—456 A **2 Claims**

1. A compound having the formula



wherein R_2 represents

in which R_4 is phenyl, and substituted-phenyl in which the substituents are chloro, nitro, and lower alkyl.

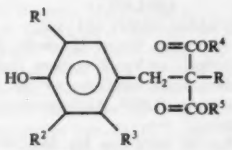
4,081,475
TRIALKYLSUBSTITUTED HYDROXYBENZYL MALONATES AND STABILIZED COMPOSITIONS

John D. Spivack, Spring Valley, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 423,347, Dec. 10, 1974, abandoned. This application Jul. 17, 1975, Ser. No. 596,865
Int. Cl.[2] C07C *69/76*
U.S. Cl. 560—55 **7 Claims**

1. Compounds having the formula

I

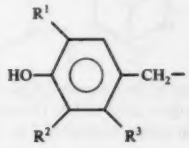


wherein

R^1, R^2 and R^3 are independently alkyl groups of 1 to 8 carbons,

R^4 and R^5 are alkyl of 1 to 30 carbons, phenyl, alkyl substituted phenyl having up to 24 carbons, or cyclohexyl, and

R is hydrogen, alkyl of 1 to 8 carbons or a group

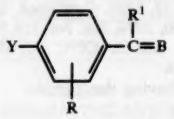


4,081,476
1-ARYL-1-LOWER ALKYL-1-BUTEN-3-OLS AND ESTER DERIVATIVES

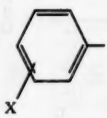
Paul L. Anderson, Dover, N.J., and Darryl A. Brittain, New York, N.Y., assignors to Sandoz, Inc., E. Hanover, N.J.

Continuation-in-part of Ser. No. 390,035, Aug. 20, 1973, abandoned. This application Nov. 19, 1975, Ser. No. 633,460
Int. Cl.[2] C07C *33/06, 69/145, 69/24, 69/72*
U.S. Cl. 560—255 6 Claims

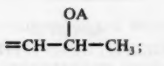
1. A compound of the formula



wherein
R is a hydrogen atom or halo having an atomic weight of from about 19 to 80;
R^1 is alkyl, having from 1 to 3 carbon atoms;
Y is



wherein
X is a hydrogen atom, halo having an atomic weight of from about 19 to 80, or alkoxy having from 1 to 4 carbon atoms; and
B is



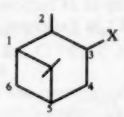
wherein
A is a hydrogen atom or alkanoyl having from 2 to 4 carbon atoms, or acetoacetyl.

4,081,477
PINANE DERIVATIVES

Werner Hoffmann, Neuhofen; Walter Himmele, Walldorf; Joachim Paust, Neuhofen; Karl Von Fraunberg, Bad Duerkheim; Hardo Siegel, Ludwigshafen, and Sigberg Pfohl, Speyer, all of Germany, assignors to BASF Aktiengesellschaft, Rheinland,Pfalz, Germany

Filed Jan. 27, 1975, Ser. No. 544,306
Claims priority, application Germany, Jan. 30, 1974, 2404306
Int. Cl.[2] C07C *87/40*
U.S. Cl. 260—563 P 3 Claims

1. Pinane derivatives of the formula I



(I)

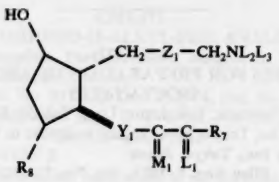
wherein X is a group of the formula $—CH_2—N(R^1)R^2$ in which R^1 and R^2 are hydrogen, alkyl of 1 to 12 carbon atoms, cycloalkyl of 5 to 8 carbon atoms, aralkyl of 7 to 10 carbon atoms or phenyl.

4,081,478
2-DECARBOXY-2-AMINO-METHYL-PGF$_\alpha$ COMPOUNDS

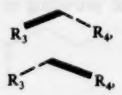
Norman A. Nelson, Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 645,276, Dec. 29, 1975, abandoned. This application Aug. 30, 1976, Ser. No. 719,054
Int. Cl.[2] C07C *87/24;* A61K *31/13, 31/135*
U.S. Cl. 260—563 R 472 Claims

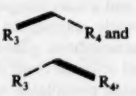
1. A prostaglandin analog of the formula



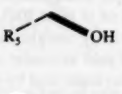
wherein R_8 is hydrogen or hydroxy;
wherein L_1 is



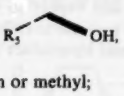
or a mixture of



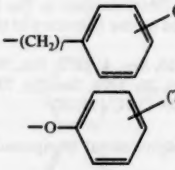
wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is methyl only when the other is hydrogen or methyl;
wherein L_2 and L_3 are hydrogen, or alkyl of one to 4 carbon atoms, inclusive;
wherein M_1 is



or



wherein R_5 is hydrogen or methyl;
wherein R_7 is
(1) $—(CH_2)_m—CH_3$,
(2) cis—CH=CH—CH_2CH_3,



(3)

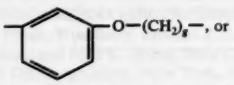
, or

(4)

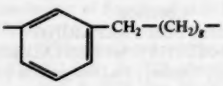
wherein 1 is zero to three, inclusive, wherein *m* is one to 5, inclusive, *s* is zero, one, 2, or 3 and T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, or alkoxy of one to 3 carbon atoms, the various T's being the same or different, with the proviso that not more than two T's are other than alkyl;

wherein Y_1 is
(1) trans—CH=CH—,
(2) cis—CH=CH—,
(3) —CH_2CH_2—, or
(4) —C≡C—, and
wherein Z_1 is
(1) cis—CH=CH—CH_2—$(CH_2)_g$—CH_2—,
(2) cis—CH=CH—CH_2—$(CH_2)_g$—CF_2—,
(3) cis—CH_2—CH=CH—$(CH_2)_g$—CH_2—,
(4) —$(CH_2)_3$—$(CH_2)_g$—CH_2—,
(5) —$(CH_2)_3$—$(CH_2)_g$—CF_2—,
(6) —CH_2—O—CH_2—$(CH_2)_g$—CH_2—,
(7) —$(CH_2)_2$—O—$(CH_2)_g$—CH_2—,
(8) —$(CH_2)_3$—O—$(CH_2)_g$—,

(9)



(10)



wherein *g* is zero, one, two, or three.

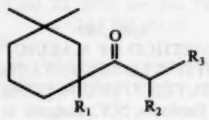
4,081,479

SUBSTITUTED-1-ACETYL-3,3-DIMETHYLCYCLOHEXANE

John B. Hall, Rumson; Mark A. Sprecker, Sea Bright; Frederick Louis Schmitt, Holmdel, and Manfred Hugo Vock, Locust, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Continuation-in-part of Ser. No. 713,429, Aug. 11, 1976, Pat. No. 4,021,488. This application Dec. 22, 1976, Ser. No. 753,617
The portion of the term of this patent subsequent to May 3, 1994, has been disclaimed.
Int. Cl.² C07C *49/61*
U.S. Cl. 260—586 R **3 Claims**

1. Compounds having the structure:



wherein R_1 is methallyl, R_2 is hydrogen and R_3 is hydrogen, or wherein R_1 is hydrogen, R_2 is methallyl and R_3 is methallyl.

4,081,480

2-MERCAPTOCYCLODODECANONE-1

William J. Evers, Red Bank; Howard H. Heinsohn, Jr., Hazlet, and Manfred Hugo Vock, Locust, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 723,535, Sep. 15, 1976, Pat. No. 4,050,632. This application Mar. 3, 1977, Ser. No. 773,964
Int. Cl.² C07C *49/27*
U.S. Cl. 260—586 M **1 Claim**

1. 2-Mercaptocyclododecanone-1.

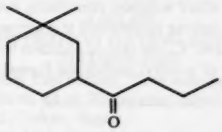
4,081,481

1-BUTANOYL-3,3-DIMETHYLCYCLOHEXANE

Mark A. Sprecker, Sea Bright; Manfred Hugo Vock, Locust; Frederick Louis Schmitt, Holmdel; John B. Hall, Rumson, and James Milton Sanders, Eatontown, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Continuation-in-part of Ser. No. 713,357, Aug. 11, 1976, Pat. No. 4,062,894. This application Nov. 11, 1976, Ser. No. 740,948
Int. Cl.² C07C *49/43*
U.S. Cl. 260—586 R **1 Claim**

1. 1-Butanoyl-3,3-dimethylcyclohexane represented by the structure:



4,081,482

MANUFACTURE OF 2,6,6-TRIMETHYL-CYCLOHEX-2-EN-1-ONE

Manfred Baumann, Mannheim, and Werner Hoffmann, Neuhofen, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Oct. 1, 1976, Ser. No. 728,530
Claims priority, application Germany, Oct. 22, 1975, 2547223
Int. Cl.² C07C *45/00*
U.S. Cl. 260—586 C **13 Claims**

1. A process for the manufacture of 2,6,6-trimethyl-cyclohex-2-en-1-one which comprises reacting ethyl isopropyl ketone with acrolein in an organic solvent, at from 40° to 150° C. and in the presence of a strong organic acid as the catalyst which has a pK_a of >1 and is selected from the group consisting of p-toluenesulfonic acid, benzenesulfonic acid, o-toluenesulfonic acid, p-methoxy-benzenesulfonic acid, p-chlorobenzenesulfonic acid, p-bromo-benzenesulfonic acid, β-naphthylsulfonic acid, α-naphthylsulfonic acid and trichloroacetic acid.

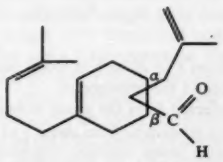
4,081,483

1-(2-METHYL-2-PROPENYL)-3-(4-METHYL-3-PENTENYL)-Δ^3-CYCLOHEXENE-1-CARBOXALDEHYDE AND 1-(2-METHYL-2-PROPENYL)-4-(4-METHYL-3-PENTENYL)-Δ^3-CYCLOHEXENE-1-CARBOXALDEHYDE

John B. Hall, Rumson; Mark A. Sprecker, Sea Bright; Manfred Hugo Vock, Locust, all of N.J.; Edward J. Shuster, Brooklyn, N.Y.; Joaquin Vinals, Red Bank, and Robert M. Novak, Fords, both of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Continuation-in-part of Ser. No. 741,088, Nov. 11, 1976. This application Jun. 30, 1977, Ser. No. 811,620
Int. Cl.² C07C *47/38*
U.S. Cl. 260—598 **3 Claims**

1. A mixture of the compounds 1-(2-methyl-2-propenyl)-3-(4-methyl-3-pentenyl)-Δ^3-cyclohexene-1-carboxaldehyde and 1-(2-methyl-2-propenyl)-4-(4-methyl-3-pentenyl)-Δ^3-cyclohexene-1-carboxaldehyde defined by the structure:



wherein the carboxaldehyde moiety is bonded either at the

alpha-carbon atom or the beta-carbon atom of the cyclohexenyl moiety.

4,081,484

METHOD FOR PREPARING CARBORANE

William Vernon Hough, Evans City, Pa., assignor to Mine Safety Appliances Company, Pittsburgh, Pa.

Filed May 28, 1976, Ser. No. 690,859
Int. Cl.[2] C07F 5/02
U.S. Cl. 260—606.5 B **5 Claims**

1. A method of preparing n-hexyl carborane comprising the step of adding an ether solution containing decaborane and a dialkylsulfide to 1-octyne maintained at a temperature between about 110° C and 140° C, the rate of addition being commensurate with the rate of n-hexyl carborane formation.

4,081,485

HYDROQUINONE-KETONE MOLECULAR COMPOUND AND PROCESS FOR PURIFYING HYDROQUINONE USING SAID MOLECULAR COMPOUND

Tsukasa Eguchi, 2-9-506, Akabanedai 1-chome, Kita, Tokyo, Japan

Filed Dec. 28, 1976, Ser. No. 755,101
Claims priority, application Japan, Jan. 1, 1976, 51-332; Jan. 19, 1976, 51-4046
Int. Cl.[2] C07C 39/02
U.S. Cl. 260—621 A **1 Claim**

1. A process for purifying hydroquinone which comprises
(a) adding at least an equimolar amount of acetone to hydroquinone and heating the resulting mixture to the boiling point of acetone, thereby forming a hydroquinone-acetone molecular compound,
(b) adding said molecular compound to water,
(c) acidifying the resulting aqueous medium solution with sulfuric acid to a pH of about 1 to 5, and
(d) treating the acidic medium solution in the presence of sodium sulfite at a temperature of between the room temperature and the boiling point of the acidic medium solution, thereby recovering crystals of hydroquinone.

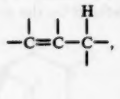
4,081,486

ALKENOL PRODUCTION

Paul R. Stapp, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 651,864, Jan. 23, 1976, Pat. No. 4,039,594, which is a division of Ser. No. 484,261, Jun. 28, 1974, Pat. No. 3,960,973. This application Mar. 29, 1977, Ser. No. 782,601
Int. Cl.[2] C07C 29/00
U.S. Cl. 260—638 R **5 Claims**

1. A process for the production of alkenols and cycloalkenols which comprises reacting:
(a) at least one alkene or cycloalkene having at least one allylic hydrogen having the basic structure



and having from 3 to 20 carbon atoms per molecule with
(b) formaldehyde in the presence of
(c) a catalyst selected from the group consistng of the fluorided aluminas containing from about 5 to about 30 weight percent fluorine under reaction conditions including an elevated temperature and pressure sufficient to produce alkenols and cycloalkenols.

4,081,487

PREPARATION OF 1-CHLORO-2-TRIFLUOROMETHYL-3,3,3-TRIFLUOROPROPENE FROM ISOBUTANE

Louis G. Anello, Hamburg; Richard F. Sweeney, Elma, and Bernard Sukornick, Williamsville, all of N.Y., assignors to Allied Chemical Corporation, Morris Township, N.J.

Filed Dec. 27, 1976, Ser. No. 754,386
Int. Cl.[2] C07C 21/18
U.S. Cl. 260—653.4 **18 Claims**

1. A process for the preparation of 1-chloro-2-trifluoromethyl-3,3,3-trifluoropropene in high yield, comprising catalytically dehydro/chlorofluorinating isobutane in a reaction zone by passing a mixture of hydrogen fluoride, chlorine and the isobutane over a dehydro/chlorofluorination catalyst selected from the group consisting of a chromium oxide and a metal fluoride dehydro/chlorofluorination catalyst.

4,081,488

PROCESS FOR PREPARING 1,1-DIHALO-4-METHYL-1,3-PENTADIENES

William George Scharpf, Yardley, Pa., assignor to FMC Corporation, Philadelphia, Pa.

Filed Dec. 24, 1975, Ser. No. 644,277
Int. Cl. C07C 11/16
U.S. Cl. 260—654 R **3 Claims**

1. A process for preparing 1,1-dichloro-4-methyl-1,3-pentadiene which comprises:
(a) condensing vinylidene chloride with isobutyryl chloride in the presence of a Lewis acid to produce 1,1-dichloro-4-methyl-1-penten-3-one,
and then
(b) reducing said 1,1-dichloro-4-methyl-1-penten-3-one with aluminum isopropoxide and isopropanol to produce 1,1-dichloro-3-hydroxy-4-methyl-1-pentene,
and then
(c) dehydrating said 1,1-dichloro-3-hydroxy-4-methyl-1-pentene at a temperature between about 100° C and 200° C with an activated clay absorbent, said clay requiring about 8 mg KOH/gm of clay to neutralize the acid contained therein, having a surface area of about 275 m^2/gm, and a particle size smaller than about 100 mesh, to produce said 1,1-dichloro-4-methyl-1,3-pentadiene.

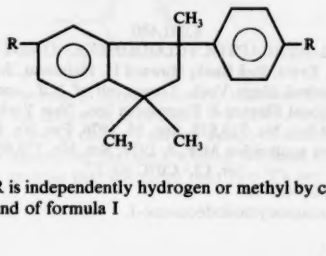
4,081,489

METHOD OF MAKING 1,1,3-TRI-SUBSTITUTED-3-PHENYLINDANE FROM α-SUBSTITUTED STYRENE COMPOUNDS

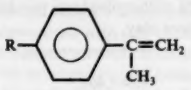
John H. Bateman, Bardonia, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 646,304, Jan. 2, 1976, abandoned. This application May 19, 1977, Ser. No. 798,740
Int. Cl.[2] C07C 15/20
U.S. Cl. 260—668 F **4 Claims**

1. An improved process for the production of compounds having the formula



wherein R is independently hydrogen or methyl by contacting a compound of formula I


(I)

or a mixture of compounds of formula I, wherein R is hydrogen or methyl, with sulfuric acid catalyst at a temperature of 100° to 225° C wherein the improvement comprises employing a catalyst consisting essentially of about 0.05 to about 3 weight percent, based on the weight of the compound or mixture of compounds of formula I, of 90 to 98% concentrated sulfuric acid.

4,081,490

HYDROCARBON CONVERSION OVER ZSM-35

Charles J. Plank, Woodbury; Edward J. Rosinski, Pedricktown, both of N.J., and Mae K. Rubin, Bala Cynwyd, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 528,061, Nov. 29, 1974, Pat. No. 4,016,245, which is a continuation-in-part of Ser. No. 393,767, Sep. 4, 1973, abandoned, which is a continuation-in-part of Ser. No. 358,192, May 7, 1973, abandoned. This application Nov. 8, 1976, Ser. No. 739,413

Int. Cl.² C07C *15/02;* C10G *11/04;* B01J *8/24;* C01B *29/28*

U.S. Cl. 260—673 **13 Claims**

1. A process for effecting catalytic conversion of a hydrocarbon compound charge which comprises contacting said charge under catalytic conversion conditions with a catalyst comprising a synthetic crystalline aluminosilicate zeolite having a composition expressed in terms of mole ratios of oxides in the anhydrous state as follows:

$$(0.3\text{–}2.5)R_2O:(0\text{–}0.8)M_2O : Al_2O_3 : (x)\ SiO_2$$

wherein R is an organic nitrogen-containing cation derived from ethylenediamine or pyrrolidine, M is an alkali metal cation and x is greater than 8 and having an X-ray powder diffraction pattern as shown in Table 1 of the specification, or a thermal decomposition product thereof.

4,081,491

SATURATED EPOXY RESIN COATING COMPOSITIONS EXHIBITING IMPROVED WEATHERABILITY

Ronald S. Bauer, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Jul. 22, 1976, Ser. No. 707,911

Int. Cl.² C08L *63/00*

U.S. Cl. 260—834 **3 Claims**

3. The composition of claim 1 wherein the glycidyl ether is derived from a hydrogenated polyhydric phenol.

4,081,492

HARDENABLE COATING COMPOSITIONS

Hans-Joachim Traenckner; Karl Fuhr; Hans Jürgen Rosenkranz, all of Krefeld, Germany; Manfred Patheiger, deceased, late of Krefeld, Germany (by Hannelore Patheiger, heir), and Hans Rudolph, Krefeld, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Jul. 22, 1976, Ser. No. 707,875

Claims priority, application Germany, Jul. 30, 1975, 2534012

Int. Cl.² C08L *63/00*

U.S. Cl. 260—837 R **2 Claims**

1. A coating composition comprising as binder a reaction product of a polyepoxide with more than one 1,2-epoxide group per molecule, wherein its epoxide groups have been reacted

a. with 0.01 to 0.5 NH-equivalents, based on one epoxide equivalent of ammonia or of an aliphatic or cycloaliphatic primary amine or of ε-aminocaproic acid or of a mixture of the aforementioned nitrogen compounds; and subsequently

b. with 0.40 to 0.90 carboxyl equivalents, based on one epoxide equivalent, of acrylic acid or methacrylic acid or of a mixture of acrylic and methacrylic acid; and finally

c. with 0.09 to 0.50 carboxyl equivalents, based on one epoxide group, of a saturated aliphatic, monocarboxylic acid,

so that at least 80% of the epoxide groups originally present have been reacted through these three component stages.

4,081,493

RESIN COMPOSITION HAVING RESISTANCE TO HYDROLYSIS

Yoshiteru Kazama; Yuji Suzuki; Yuzo Sumida; Tatsuo Hiraoka, and Yasuo Miura, all of Wakayama, Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Nov. 19, 1976, Ser. No. 743,349

Claims priority, application Japan, Nov. 21, 1975, 50-139921

Int. Cl.² C08L *75/00*

U.S. Cl. 260—859 PV **12 Claims**

1. A resin composition adapted for molding a product having improved resistance to hydrolysis, which composition has been prepared by the steps consisting essentially of adding (A) one or more polyhydric alcohols selected from the group consisting of sorbitol, mannitol, erythritol, arabitol, xylitol, dulcitol and pentaerythritol, and (B) antimony trioxide, to a mixture of (C) a blend of polyvinyl chloride resin and polyester-urethane resin, and (D) a lead stabilizer, and blending (A) and (B) into said mixture of (C) and (D), the amount of (A) being from b 0.1 to 4 parts by weight and the amount of (B) being from 0.5 to 10 parts by weight, per 100 parts by weight of (C).

4,081,494

PROCESS FOR PREPARING SOFT TRANSPARENT POLYETHER POLYESTER BLOCK COPOLYMERS

Hiroshi Sakai; Yoshihiko Takeuchi, and Shizuka Kurisu, all of Iwakuni, Japan, assignors to Teijin Limited, Osaka, Japan

Filed Dec. 15, 1975, Ser. No. 641,038

Claims priority, application Japan, Dec. 14, 1974, 49-143044; Oct. 30, 1975, 50-129813

Int. Cl.² C08L *67/02*

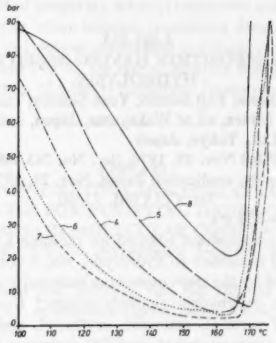
U.S. Cl. 260—860 **6 Claims**

1. In a process for preparing soft polyesters which comprises reacting (A) terephthalic acid and/or its ester-forming derivative, (B) tetramethylene glycol and/or its ester-forming derivative and (C) a poly(oxyalkylene) glycol having a molecular weight of 500 to 5,000 and a ratio of the number of carbon atoms to the number of oxygen atoms of 2 to 4.5, and/or its ester-forming derivative, the improvement wherein, after the reduced viscosity of the reaction product of the components (A), (B) and (C) has reached 0.1 (dl/g), said reaction product is further reacted with (D) a low-molecular-weight ester compound and/or a high-molecular-weight ester compound containing a terephthalic acid residue and an ethylene glycol residue, or a low-molecular-weight ester compound and/or a high-molecular-weight ester compound containing a terephthalic acid residue and a 1,4-cyclohexane dimethanol residue, to form a polyester-polyether block copolymer, the proportion of the ethylene glycol component or the 1,4-cyclohexane dimethanol component in the block copolymer being from 5 to 60 mole % based on the total amount of component (B) and the ethylene glycol component or 1,4-cyclohexane dimethanol component of component (D) in the block copolymer.

4,081,495
THERMOPLASTIC MOULDING COMPOSITIONS AND MOULDINGS OF POLYCARBONATES, WITH IMPROVED EASE OF MOULD RELEASE WHEN INJECTION-MOULDED

Dieter Freitag; Werner Nouvertné, both of Krefeld, and Frank Kleiner, Cologne, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Jul. 30, 1976, Ser. No. 710,070
Claims priority, application Germany, May 7, 1976, 2620255
Int. Cl.² C08L 67/00; C08K 5/01, 5/02
U.S. Cl. 260—860 5 Claims



1. A thermosplastic moulding composition comprising an aromatic high-moleculr weight polycarbonate based on a diphenol, with a weight-average molecular weight ($\overline{M}_w$) of at least 10,000 and from 0.5 to 5% by weight, relative to the high molecular weight polycarbonate, of a polycarbonate which has an $\overline{M}_w$ of from 1,200 to 9,000 and which corresponds to the formula (I):

$$E-CO-[O-Z-O-\overset{\overset{O}{\|}}{C}-]_n-E \qquad (I)$$

wherein
"E" represents a radical of the formula (II):

$$-(C)_x-\overset{\overset{R'}{|}}{\underset{\underset{R'}{|}}{C}}-R' \qquad (II)$$

in which
the groups R' are identical and denote H or halogen
x is an integer of from 7 to 24
"Z" is a divalent aromatic radical, and
"n", the degree of polymerisation, results from the $\overline{M}_w$ between 1,200 and 9,000.

4,081,496
THIXOTROPIC POLYESTER COMPOSITIONS CONTAINING AN ORGANOPHILIC CLAY GELLANT

Claude Malcolm Finlayson, Houston, Tex., assignor to N L Industries, Inc., New York, N.Y.

Filed Jun. 27, 1977, Ser. No. 810,478
Int. Cl.² C08L 67/06
U.S. Cl. 260—864 25 Claims

1. A thixotropic cross-linkable polyester composition comprising an unsaturated polyester and an unsaturated aromatic monomer having dispersed therein an organophilic clay gellant comprising the reaction product of a smectite-type clay having a cation exchange capacity of at least 75 milliequivalents per 100 grams of clay and a methyl benzyl dialkyl ammonium compound or a dibenzyl dialkyl ammonium compound, wherein the alkyl groups contain 14 to 22 carbon atoms and the amount of said ammoniuum compound reacted with said clay being from 100 to 120 milliequivalents per 100 grams of clay based upon 100% active clay.

4,081,497
METHOD FOR PRODUCING A HIGH IMPACT POLYSTYRENE

Ichiro Tokumitsu; Hideo Konuma; Shigeaki Mochizuki; Yoshio Okada; Hiroshi Yasumoto, and Isao Yoshihiro, all of Tokuyama, Japan, assignors to Idemitsu Petrochemical Co., Ltd., Tokyo, Japan

Filed Jul. 8, 1976, Ser. No. 703,475
Claims priority, application Japan, Jul. 9, 1975, 50-83531
Int. Cl.² C08L 9/06, 8/06
U.S. Cl. 260—880 R 7 Claims

1. A method for producing a high-impact polystyrene from reactants that include
(I) at least one monomer selected from the group consisting of styrene, halogenated styrenes and alkyl styrenes, and
(II) a rubbery polymer,
the improvement which comprises
(a) in a first stage passing said reactants into a tubular reaction zone,
(1) constricting the flow of said reactants in at least one portion of said tubular reaction zone so as to create shearing conditions in each such portion while maintaining laminar flow as much as possible in the unconstricted remainder of said tubular reaction zone, and
(2) forming a prepolymer in said first stage by converting 10 - 60% of the monomers to polymers in said tubular reaction zone,
(b) in a second stage completing the polymerization of the reaction mixture resulting from said first stage in a polymerization zone wherein there is essentially no shearing.

4,081,498
LUSTROUS, ANTISOILING FLAME RETARDANT ACRYLIC FIBERS AND PROCESS THEREFOR

Arutun Maranci, Westport, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Filed May 9, 1973, Ser. No. 358,743
Int. Cl.² C08L 33/20
U.S. Cl. 260—898 10 Claims

1. A flame retardant acrylic fiber having a luster value of at least about 17.5% and a light transmission of less than about 25% which comprises a first fiber-forming acrylonitrile polymer containing at least 50 weight percent acrylonitrile, an amount of a halogen-containing vinyl monomer sufficient to impart flame retardancy to said fiber, and any balance of a halogen-free vinyl monomer, and heterogeneously dispersed within said first polymer, a second acrylonitrile polymer free from any halogen content and containing at least 70 weight percent acrylonitrile and any balance of one or more halogen-free vinyl monomers, said second polymer being incompatible with said first polymer and being present in an amount of about 2 to 15 weight percent based on the total weight of said first and second polymers.

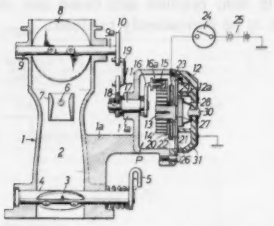
4,081,499
CARBURETOR WITH ELECTRIC HEATING TYPE AUTOCHOKE DEVICE

Makoto Ishii, Wako; Masahiko Iiyama, Tokyo, and Masaaki Ozaki, Sayama, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 7, 1977, Ser. No. 804,277
Claims priority, application Japan, Jun. 15, 1976, 41-69939
Int. Cl.² F02M 1/12
U.S. Cl. 261—39 E 3 Claims

1. A carburetor including a choke valve arranged in the intake duct thereof and provided with an electric heating type

autochoke device, comprising a casing fixed to the body of the carburetor, a bimetal element accommodated in said casing and operatively connected with said choke valve so as to open the latter as said bimetal element is deformed under heat, an electric heater disc arranged in said casing in spaced opposite relation to said bimetal element and adapted to be supplied with electric current from a source of electric voltage during engine operation, a heat-conducting plate fixedly secured to



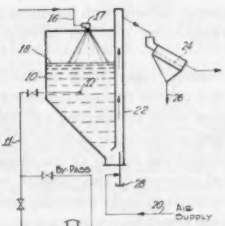
said casing in a position adjacent to said electric heater disc on the side thereof remote from said bimetal element, and a resistance element having a positive temperature coefficient supported on the side of said heat-conducting plate remote from said electric heater disc and inserted in the heater circuit in series with said electric heater disc, said heat-conducting plate and said resistance element being formed to define therebetween a hollow chamber of limited volume effective to control heat transmission to said resistance element.

4,081,500

SULPHUR PELLETIZATION PROCESS

David George Malcolm, Saskatoon, Canada, assignor to The Cambrian Engineering Group Limited, Saskatoon, Canada

Continuation-in-part of Ser. No. 618,487, Oct. 1, 1975, abandoned. This application Mar. 23, 1977, Ser. No. 780,447
Claims priority, application Canada, Oct. 3, 1974, 210688
Int. Cl.² B01J *2/02*
U.S. Cl. 264—9 **9 Claims**



1. A process for pelletizing sulphur comprising:

a. feeding molten sulphur at a temperature of 260°–330° F to a nozzle producing a hollow cone spray at a pressure of less than 40 psig producing a downwardly diverging hollow conical sheet of said molten sulphur; and

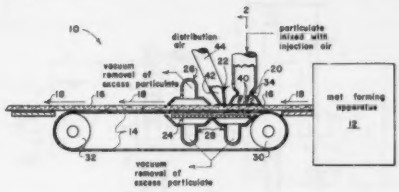
b. impacting said conical sheet of molten sulphur upon the surface of a body of water having a temperature in the range 40°–210° F spaced below said nozzle producing a turbulent swirling action in said water, said sheet of molten sulphur separating into droplets which are cooled by said water to solidification to form said pellets.

4,081,501

PROCESS FOR PRODUCING ODOR ABSORBENT AND ADSORBENT AIR FILTER MEDIA

John P. Muther, 8600 Queensmere Pl., Richmond, Va. 23229

Filed Jul. 9, 1976, Ser. No. 704,078
Int. Cl.² B29C *17/04*
U.S. Cl. 264—89 **10 Claims**



1. A process of forming odor absorbent filter media for use in an environmental air recirculating system, comprising the steps of:

a. forming an air pervious mat of randomly overlaid fibers;

b. moving the mat along a path of travel past first and second closely spaced distribution head means;

c. directing a first stream of pressurized air discharging through the first distribution head means to inject dry, odor absorbent particulate material into the mat among its fibers;

d. directing a second stream or streams of pressurized air discharging through the second distribution head means to effect a desired distribution of the injected particulate material among the mat fibers;

e. thereafter applying a bonding agent to said mat so as to form a bonded mat and to bond a part of the injected and distributed particulate material to the mat fibers; and

f. withdrawing and collecting the unbonded injected and distributed particulate material from said mat leaving the odor absorbent filter media.

4,081,502

PROCESS FOR THE PRODUCTION OF HOMOGENEOUS, BAR-SHAPED OR GRANULAR THERMOPLASTIC COMPOSITIONS

Harald Blümel, and Paul Lipp, both of Marl, Germany, assignors to Chemische Werke Huls Aktiengesellschaft, Marl, Germany

Filed Oct. 17, 1975, Ser. No. 623,510
Claims priority, application Germany, Oct. 19, 1974, 2449491
Int. Cl.² B02C *4/00*
U.S. Cl. 264—140 **18 Claims**

1. A process for the production of a thermoplastic composition comprising a homogeneous blend of

(i) 100 parts by weight of a saturated or unsaturated block polyolefin elastomer having a green polymer tensile strength of at least 20 and up to 220 kp./cm² at 25° C. and a viscosity of 20–150 Mooney units (ML_{1+4} at 100° C.) and

(ii) 25–900 parts by weight of bitumen, which comprises:

(a) kneading bitumen with crumbs, granules or powders of said elastomer in a kneader at a temperature of about 50°–220° C. for about 1–100 minutes to form a viscous, homogeneous composition;

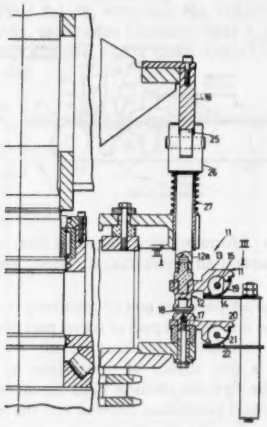
(b) after homogenization is effected, cooling the resultant composition sufficiently to minimize the adhesion to the inner wall and rotor of the kneader which adhesion in the absence of said cooling frequently prevents ejection of the composition; and

(c) ejecting at least 95% of the cooled composition from the kneader.

4,081,503
METHOD OF FORMING CLOSURE LINERS

Keith Shotbolt, Gerrards Cross, England, assignor to W. R. Grace & Co., Cambridge, Mass.

Filed Jul. 25, 1974, Ser. No. 491,749
Int. Cl.[2] B29D *31/00*
U.S. Cl. 264—268 3 Claims

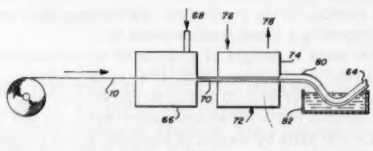


1. In a method of moulding a thermoplastic material into a gasket for a container closure comprising the steps of heating a quantity of the material and deforming said material into a desired finished configuration, the improvement wherein the material in the form of a pellet is placed into the closure and is subjected to two consecutive deformation operations, the first operation being carried out with a heated pressure member which both heats the thermoplastic material and deforms it into a partially moulded configuration, and the second operation being carried out using a positively cooled moulding member, shaped to impart the desired finished configuration to the thermoplastic material, which is maintained at a temperature lower than that of the heated and partially deformed thermoplastic material.

4,081,504
ENCAPSULATED COMPOSITE METALLIZED STRIP AND METHOD OF MAKING THE SAME

Brian A. Wenrick, Dayton, and Michael G. Gross, Tipp City, both of Ohio, assignors to Protective Treatments, Inc., Dayton, Ohio

Filed May 10, 1976, Ser. No. 685,095
Int. Cl.[2] B29F *3/10*
U.S. Cl. 264—174 8 Claims



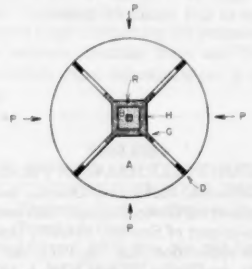
1. A method of producing a laterally bent and longitudinally bendable encapsulated metallized extrusion, comprising the steps of:

extruding a composite extrusion product, including feeding a metallized composite strip to an extruder, said metallized composite strip being constituted by a rigidifying plastic support layer having a thickness of from 0.010 inch to 0.050 inch bonded to a layer of transparent plastic having a metallic film coating with a thickness less than 25 microns on the face thereof bonded to said support layer, feeding molten transparent plastic to said extruder, encapsulating the metallized composite strip within said molten transparent plastic, and withdrawing the encapsulated metallized composite strip from the extruder; drawing the composite extrusion product through a forming zone; laterally bending the composite extrusion product in the forming zone so as to provide a laterally bent and longitudinally bendable encapsulated metallized extrusion having a nonplanar cross section; and cooling said composite extrusion product in the forming zone to rigidify said laterally bent product and cause said non-planar cross section to be permanently retained.

4,081,505
METHOD OF COMPRESSING A MATERIAL UNDER HIGH PRESSURE

Naoto Kawai, 4-3-1 Midorigaoka, Toyonaka, Osaka, Japan

Filed Sep. 13, 1976, Ser. No. 722,704
Int. Cl.[2] B30B *7/04*
U.S. Cl. 264—313 9 Claims



1. A method of compressing a sample under ultra-high pressure comprising the steps of:

a. embedding said sample to be compressed in a pressure transmitting medium consisting essentially of powder of an inorganic material having high hardness and cleavage, the pressure transmitting medium having voids therewithin;

b. inserting the pressure transmitting medium and the embedded sample in a central pressure chamber of a pressure vessel, the pressure vessel comprising a plurality of spherical segments which are movable radially inwardly relative to each other toward the center of the pressure vessel;

c. applying external pressure to the pressure vessel to force the spherical segments radially inwardly toward the center of the pressure vessel to:

i. compact the pressure transmitting medium;

ii. reduce the voids in the pressure transmitting medium; and

iii. progressively reduce the area of contact between the sample and the pressure transmitting medium which is being forced inwardly by each spherical segment,

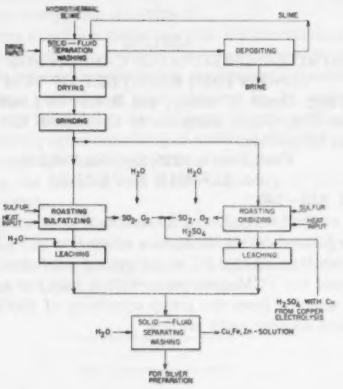
whereby the ratio between the external area of the pressure vessel and the area of contact between the sample and the pressure transmitting medium progressively increases and the magnification between the external pressure and the pressure exerted on the sample by the pressure transmitting material is progressively increased so that ultra-high pressure is applied to the sample.

4,081,506

METHOD FOR RECOVERING NON-FERROUS METALS FROM HYDRO-THERMAL SLIME

Peter Proplesch, and Erich Zimmer, both of Julich, Germany, assignors to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung, Julich, Germany

Filed Jul. 6, 1976, Ser. No. 702,866
Claims priority, application Germany, Jul. 5, 1975, 2530203
Int. Cl.[2] C01G *3/10, 9/06*
U.S. Cl. 423—41 5 Claims



1. A method of recovering non-ferrous metal from hydrothermal slimes containing metals selected from the group of Fe, Zn, Cu, and Ag, which includes the steps of: separating the brine from the slime, drying the thus obtained slime with the solids therein, grinding the dried solids, feeding from 5 to 15% by weight of sulfur to one portion of said ground slime and roasting same in a sulfatizing manner at a temperature of from 400° to 450° C and leaching the thus roasted one portion of the thus obtained slime with water; roasting the other portion of said ground slime in an oxidizing manner at a temperature of from 350° to 400° C, and leaching the thus treated other portion with diluted sulfuric acid, at least a portion of said sulfuric acid being obtained by conversion of sulfur oxides into sulfuric aicd, which sulfur oxides are contained in the waste gas and formed therein during said sulfatizing and oxidizing roasting.

4,081,507

PROCESS FOR REMOVING CHEMISORBED AND INTERSTITIAL CHLORINE AND CHLORIDES FROM A HOT TITANIUM DIOXIDE BENEFICIATE-CARBON MIXTURE

Wendell E. Dunn, Jr., North Sydney, Australia, assignor to Titanium Technology N.V., Curacao, Netherlands Antilles

Continuation-in-part of Ser. No. 349,255, Apr. 9, 1973, Pat. No. 3,960,203, which is a continuation-in-part of Ser. No. 138,461, Apr. 29, 1971, abandoned. This application Oct. 3, 1975, Ser. No. 619,204
Int. Cl.[2] C01G *23/04;* C01B *31/02;* F28D *13/00*
U.S. Cl. 423—74 3 Claims

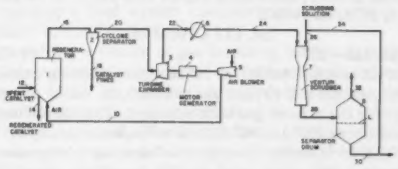
1. A process for removing chemisorbed and interstitial chlorine and chlorides from a titanium dioxide beneficiate - carbon mixture having a temperature of 900° to 1080° C. produced by reacting under fluidizing conditions, chlorine with a titaniferous ore, having a particle size of 100 to 200 mesh, mixed with 5 to 35%, by weight, of particulate carbon, at a temperature of 900° to 1080° C. comprising contacting, under fluidizing conditions, said beneficiate - carbon mixture with steam, moist air or moist inert gas at a flow rate of at least 0.5 ft/sec., exiting chemisorbed and interstitial chlorine and chlorides liberated thereby and cooling said beneficite - carbon mixture to a temperature of 150° to 350° C.

4,081,508

PROCESS FOR REDUCING FLUE GAS CONTAMINANTS FROM FLUID CRACKING CATALYST REGENERATOR

Edward C. Luckenbach, Mountainside, N.J., assignor to Exxon Research & Engineering Co., Linden, N.J.

Filed Jun. 4, 1975, Ser. No. 583,555
Int. Cl.[2] B01D *47/00*
U.S. Cl. 423—210 8 Claims



1. A process for reducing flue gas contaminants produced when spent hydrocarbon cracking catalysts having coke deposited thereon are regenerated, which comprises:

(a) burning the coke on the spent catalyst in a regenerator to produce a catalyst having a coke on regenerated catalyst level less than 0.3 wt. % and a flue gas containing less than 2.0 vol. % carbon monoxide;

(b) expanding the flue gas from the regenerator through a turbine to reduce the pressure thereof;

(c) recovering and utilizing energy produced from said expansion;

(d) introducing the expanded flue gas into a venturi structure at a pressure in the range of 1.5 to 4.0 psig;

(e) introducing an aqueous scrubbing mixture at a pressure less than 10 psig into the venturi structure for mixture with said flue gas;

(f) passing said flue gas and said scrubbing mixture through a constricted passage of said venturi structure to increase the turbulence and velocity of the liquid and gaseous streams thereby producing intimate contact thereof;

(g) discharging said mixture of gas and scrubbing liquid into a separation zone; and

(h) separating said mixture of gas and scrubbing liquid into a liquid portion and a gaseous portion having a reduced content of solid catalytic particles and acidic gases.

4,081,509

METHOD FOR REMOVING NITROGEN OXIDES FROM FLUE GAS BY ABSORPTION

Yukio Hishinuma, Hitachi; Hidetoshi Akimoto, Ibaraki; Ryuichi Kaji; Fumito Nakajima, both of Hitachi, and Yoshijiro Arikawa, Hitachi, all of Japan, assignors to Hitachi, Ltd. and Babcock-Hitachi Kabushiki Kaisha, both of, Japan

Filed Mar. 19, 1976, Ser. No. 668,432
Claims priority, application Japan, Mar. 31, 1975, 50-38868
Int. Cl.[2] C01B *21/00*
U.S. Cl. 423—235 17 Claims

1. A method for removing nitrogen oxides comprising nitrogen monoxide from a flue gas by absorption, which comprises contacting in the presence of oxygen a flue gas containing nitrogen oxides comprising nitrogen monoxide with an aqueous solution comprising a transition metal complex compound of a transition metal and a ligand, wherein said transition metal complex compound forms a complex with oxygen, where said transition metal is selected from the group consisting of divalent cobalt and divalent chromium and where a ligand of said transition metal complex compound is selected from the group consisting of ammonia, an amine, and an imidazole derivative retaining the imidazole moiety whereby nitrogen monoxide is oxidized and absorbed as nitrous acid in said aqueous solution.

4,081,510

PROCESS FOR CATALYTICALLY TREATING AN EXHAUST GAS CONTAINING AMMONIA GAS AND OXYGEN GAS TO REDUCE SAID AMMONIA GAS TO NITROGEN

Akira Kato; Shimpei Matsuda; Shigeo Uno; Jinichi Imahashi, and Fumito Nakajima, all of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Oct. 13, 1976, Ser. No. 731,929

Claims priority, application Japan, Oct. 15, 1975, 50-123248; Dec. 5, 1975, 50-144002

Int. Cl.² C01C *3/00*

U.S. Cl. 423—237 **19 Claims**

1. A process for treating an exhaust gas consisting essentially of ammonia gas and oxygen gas as reactants, which comprises contacting the exhaust gas with a catalyst at a reaction temperature of about 250° to 450° C. and at a space velocity of 1,000 to 100,000 h^{-1} thereby to oxidize and decompose the ammonia to nitrogen and water, said catalyst consisting essentially of 0.02 to 2 moles of copper oxide, up to 0.5 mole of an oxide of a metal component selected from the group consisting of molybdenum, tungsten, vanadium, iron, cerium and mixtures thereof, the balance being catalytically active titanium oxide having a surface area not smaller than 20 m^2/g, the molar amounts of the copper oxide and the oxide of the metal component being based on one mole of the titanium oxide.

4,081,511

PROCESS FOR REMOVING NITRIC OXIDES FROM PROCESSING EXHAUST GASES

Karl Heinrich Laue, Hattingen; Theo Sander, Essen; Peter Sauder, Essen, and Gotthard Uckert, Essen, all of Germany, assignors to Didier Engineering GmbH, Essen, Germany

Division of Ser. No. 668,512, Mar. 19, 1976. This application Nov. 23, 1976, Ser. No. 744,448

Claims priority, application Germany, Mar. 21, 1975, 2512410

Int. Cl.² B01D *53/34*

U.S. Cl. 423—239 A **7 Claims**

1. A process for the simultaneous single-stage removal of NO_2 and NO from the exhaust gases of nitrogen-oxygen processing installations, particularly nitric acid production plates, said process comprising:

receiving NO_2 and NO containing exhaust gases from a processing installation at an elevated pressure of from 2 to 12 atmospheres absolute;

passing said exhaust gases through a heat exchanger and heating said exhaust gases therein to a temperature of from 260° to 340° C. while maintaining said exhaust gases at said elevated pressure;

providing a catalytic reactor separate from said heat exchanger and including plural separate catalyst beds connected in series, such that each said catalyst bed comprises a mixed oxide catalyst of iron oxide and chromium oxide, such that the quantities of said mixed oxide catalyst provided in each said catalyst bed are different, such that each said catalyst bed has an inlet side and an outlet side, and such that each said catalyst bed has at said inlet side thereof an enclosed chamber;

passing said heated and pressurized exhaust gases from said heat exchanger through the enclosed chamber of an upstream-most said catalyst bed, then through said upstream-most catalyst bed, and then serially through the remainder of the plural enclosed chambers and catalyst beds;

simultaneously supplying gaseous ammonia to all of said plural enclosed chambers to mix with the said exhaust gases therein and to thereby reduce NO_2 and NO in a single step from said exhaust gases during passage thereof through the respective said catalyst beds, the volumes of said gaseous ammonia supplied to said enclosed chambers being different and in inverse relation to the quantities of said mixed oxide catalyst of the respective said catalyst beds, such that the more of said mixed oxide catalyst in a given said catalyst bed, the less of said gaseous ammonia is supplied to the respective said enclosed chamber, and vice versa, whereby purified exhaust gases exit from the downstream-most catalyst bed, and the reduction of said NO_2 and NO producing exothermic heat which further heats said purified exhaust gases;

thereafter cooling said purified exhaust gases at a position separate from said catalytic reactor; and

thereafter relieving the elevated pressure of the thus cooled purified exhaust gases.

4,081,512

NITRITE-IMPREGNATED CARBON FOR THE ADSORPTION RECOVERY OF VCM

Kang Yang; James D. Reedy, and Robert C. Lindberg, all of Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

Filed Dec. 9, 1976, Ser. No. 748,010

Int. Cl.² B01D *53/34, 53/02*

U.S. Cl. 423—240 **5 Claims**

1. A method for reducing formation of acetylene and carbon dioxide formed during the carbon adsorption of VCM from air streams containing said VCM comprising impregnating carbon to be used for VCM adsorption with at least one nitrite compound selected from the group consisting of alkali metal nitrites, and alkaline earth nitrites.

4,081,513

DISPOSAL OF SULFUR OXIDE POLLUTANT-CONTAINING GAS

Gerald Moss, Oxford, England, assignor to The United States of America as represented by Administrator U.S. Environmental Protection Agency, Washington, D.C.

Filed Dec. 9, 1975, Ser. No. 639,132

Claims priority, application United Kingdom, Dec. 11, 1974, 53536/74

Int. Cl.² C01B *17/00;* B01J *8/00*

U.S. Cl. 423—244 **21 Claims**

1. A method of reducing the content of a sulfur oxide pollutant in a gas containing said pollutant, comprising the steps of:

(a) contacting the gas at an elevated temperature in a reaction zone with particulate solids of which at least some comprise calcium-containing pollutant-reactive material whereby at least a portion of said pollutant is removed from the gas by reaction with the pollutant-reactive material;

(b) recovering from the reaction zone a gas of reduced pollutant content and entrained solids comprising at least some of said pollutant-reactive material, the temperature of the recovered gas exceeding the dew point of a liquid component of a gas-scrubbing liquid used in step (c);

(c) scrubbing the recovered gas in a scrubbing zone with the scrubbing liquid referred to in step (b), said scrubbing liquid being selected from the group consisting of water and basic aqueous solutions, whereby to scrub out entrained solids from the recovered gas and to produce a scrubbed gas of reduced pollutant content;

(d) recovering gas-scrubbing liquid containing solids scrubbed out of the gas in the scrubbing zone;

(e) circulating a first portion of the recovered gas-scrubbing liquid to the scrubbing zone to scrub further amounts of recovered gas, and

(f) passing a second portion of the recovered gasscrubbing liquid in contact with the particulate solids whereby to evaporate the said liquid component into the gas in the reaction zone and to deposit on the particulate solids solid materials remaining after the evaporation of the said liquid component.

4,081,514

PROCESS FOR PRODUCING FLUIDIZED MORDENITE PARTICLES

Leonard B. Sand, Holden, and Glenn W. Dodwell, Worchester, both of Mass., assignors to Zeochem Corporation, Worcester, Mass.

Filed Feb. 10, 1976, Ser. No. 656,782
Int. Cl.[2] C01B *33/28*
U.S. Cl. 423—328 10 Claims

1. A process for the formation of acid-stable particles of the zeolite mordenite in the fluidizable size range from 20 to 150 micrometers, comprising the steps of:

a. preparing a reaction mixture in which a mineralizing agent is provided and in which at least one component of the reaction mixture is provided in the form of a dispersion of ingredient particles of silica-alumina in the size range capable of fluidization in a medium of sodium silicate the mineralizing agent consisting of sodium halide and serving to increase the viscosity of the mixture,

b. seeding the mixture with a small quantity of mordenite seed crystals,

c. placing the seeded mixture in an autoclave, and

d. reacting the mixture at a temperature in the range from 150° to 250° C until mordenite crystallizes in the form of particles in said fluidizable size range.

4,081,515

CATALYTIC CONVERSION OF AN AMMONIUM SULFATE TO SULFUR DIOXIDE AND AMMONIA

Henri Gruhier, Chatillon, Bagneux; André Deschamps, and Philippe Renault, both of Noisy le Roi, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed May 31, 1977, Ser. No. 801,981
Claims priority, application France, May 31, 1976, 76 16566
Int. Cl.[2] C01B *21/00, 17/50*
U.S. Cl. 423—351 8 Claims

1. In a process for converting molten ammonium sulfate to ammonia and sulfur dioxide, in which said molten ammonium sulfate is contacted with a catalyst and ammonia and sulfur dioxide are collected, the improvement which comprises using a catalyst selected from molybdenum and/or tungsten compounds.

4,081,516

SEPARATION OF CATALYST PARTICLES FROM A SUSPENSION OF THESE PARTICLES IN AN AQUEOUS HYDROXYL-AMMONIUM SALT SOLUTION

Joseph J. F. Scholten, Sittard, and Hendrik L. T. Koks, Geulle, both of Netherlands, assignors to Stamicarbon, B.V., Geleen, Netherlands

Filed Sep. 18, 1975, Ser. No. 614,663
Claims priority, application Netherlands, Sep. 19, 1974, 7412381
Int. Cl.[2] C01B *21/14*
U.S. Cl. 423—387 7 Claims

1. In a process for the preparation and isolation of hydroxylamine comprising reducing an oxidic nitrogen compound selected from the group consisting of nitrogen monoxide, nitric acid and a nitrate salt by treating said oxidic nitrogen compound in an aqueous acid medium with hydrogen and a hydrogenation catalyst to form a suspension-solution containing hydroxylammonium salt and separating said hydroxylammonium salt from said suspension-solution, the improvement comprising adding starch, gelatin, polyacrylamide or polyvinyl alcohol to said aqueous acid medium.

4,081,517

NITROGEN OXIDE CONVERSION PROCESS

Bertrand J. Mayland, Louisville, Ky., assignor to Chenoweth Development Laboratories, Inc., Louisville, Ky.

Continuation of Ser. No. 557,914, Mar. 13, 1975, abandoned.
This application Dec. 9, 1976, Ser. No. 748,903
Int. Cl.[2] C01B *21/40*
U.S. Cl. 423—393 8 Claims

1. A process for producing concentrated nitric acid from nitrogen oxides carried by a fluid stream, including the steps of:

(a) passing a fluid stream containing nitrogen oxides and water to oxidizer means;

(b) supplying a stream of gas including oxygen to said oxidizer means to be contacted by both nitrogen oxides and water which are contained in said fluid stream to react a portion thereof to aqueous nitric acid;

(c) removing liquid effluent containing nitrogen oxides and said aqueous nitric acid from said oxidizer means;

(d) passing said liquid effluent from said oxidizer means to bleaching means;

(e) passing an off gas stream from said oxidizer means to scrubbing means;

(f) passing liquid effluent from said scrubbing means, to said bleaching means;

(g) supplying an aqueous solution including nitric acid to said scrubbing means to contact said off gas stream passed to said scrubbing means;

(h) passing a gaseous stream that is first mixed with an off gas stream emitted from said scrubbing means through said bleaching means in countercurrent contact with said liquid effluents received from said oxidizer means and said scrubbing means for stripping of nitrogen oxides from said liquid effluents;

(i) passing an off gas stream emitted from said bleaching means and containing nitrogen oxides stripped therein to said oxidizer means to be contacted with said fluid stream; and

(j) removing effluent containing an aqueous solution of concentrated nitric acid from said bleaching means.

4,081,518

GASEOUS PRODUCT STREAM

Clifford E. Selin, Salt Lake City, Utah, and Wayne A. Proell, Seymour, Ind., assignors to American Hydrocarbon Company, Salt Lake City, Utah

Filed Oct. 13, 1976, Ser. No. 732,037
Int. Cl.[2] C01B *21/36*
U.S. Cl. 423—400 2 Claims

1. A method of concentrating nitrogen oxides from a stream comprising a noncondensable mixture of oxygen and nitrogen and below about 2.5% by weight of a mixture of nitrogen oxides which comprises:

introducing said stream into an absorption zone maintained at a temperature of below about 90° F and at about atmospheric pressure;

contacting said stream in said absorption zone with a countercurrently flowing stream consisting essentially of between about 10 and about 35% by weight nitric acid to absorb said nitrogen oxides from said stream in said nitric acid stream, the rate of flow of said nitric acid into said absorption zone being such that the partial pressure of the nitrogen oxides absorbed in said nitric acid is lower than the partial pressure of the nitrogen oxides in said stream;

withdrawing said noncondensable mixture of oxygen and nitrogen from said absorption zone;

passing the resulting solution of nitrogen oxides in said nitric acid liquid in descending countercurrent contact in a stripping zone with an ascending stream of air at a temperature of between about 60° and about 120° F and at about atmospheric pressure to essentially strip said nitrogen oxides from said nitric acid liquid;

returning the resulting nitric acid liquid to the absorption zone; and

recovering the resulting stream of air and concentrated nitrogen oxides.

4,081,519

PROCESS FOR OXIDATION OF CARBON MONOXIDE WITH INORGANIC OXIDIZING AGENTS

James M. Whelan, La Canada, Calif., assignor to University of Southern California, Los Angeles, Calif.

Division of Ser. No. 556,670, Mar. 10, 1975, Pat. No. 3,976,599, which is a division of Ser. No. 194,769, Oct. 8, 1971, Pat. No. 3,885,020. This application Aug. 5, 1976, Ser. No. 712,001

Int. Cl.² C01B *31/20*

U.S. Cl. 423—437 **4 Claims**

1. A process for the oxidation of carbon monoxide to carbon dioxide with an inorganic oxidizing agent selected from the group consisting of water, nitric oxide and sulfur dioxide, which comprises:

combining the carbon monoxide with a predetermined amount of said oxidizing agent to give at least a stoichiometric amount of the oxidizing agent for the oxidation of the carbon monoxide to carbon dioxide; and

passing the mixture over a ceramic catalyst of the following empirical formula at an elevated temperature:

$$W_kX_nJ_{(1-k-n)}ZO_{(3\pm m)}$$

wherein:

W is Zirconium, Tin or Thorium or mixture thereof;

X is an alkaline earth metal or mixture thereof;

J is Scandium, Yttrium, a rare-earth element or mixture thereof;

Z is a metal of the first transition series or a mixture thereof, at least 0.01% of said metal having an oxidation state other than +3;

k is a number having a value of between 0 and about 0.1;

m is a number having a value of from 0 to about 0.26; and

n is a number having a value from 0 to about 0.51, provided when n has a value of 0, k has a value between 0 and about 0.05.

4,081,520

HIGH EFFICIENCY PRODUCTION OF CHLORINE DIOXIDE BY SOLVAY PROCESS

Richard Swindells, Caledon, and Maurice C. J. Fredette, Mississauga, both of Canada, assignors to ERCO Industries Limited, Islington, Canada

Filed Feb. 22, 1977, Ser. No. 770,360

Claims priority, application United Kingdom, Mar. 19, 1976, 11123/76; May 7, 1976, 18783/76

Int. Cl.² C01B *11/02*; C01D *5/02, 5/00*

U.S. Cl. 423—478 **1 Claim**

1. In a process of producing chlorine dioxide by reducing sodium chlorate with methanol in an aqueous reaction medium containing sulphuric acid in the substantial absence of added chloride ions, the improvement comprises:

maintaining a single-chambered generator-evaporator-crystallizer apparatus containing said aqueous reaction medium under a subatmospheric pressure, maintaining said reaction medium at its boiling point at a temperature below that above which substantial decomposition of chlorine dioxide occurs to evaporate water from the reaction medium and provide a gaseous mixture containing steam and chlorine dioxide,

removing said gaseous mixture from said single-chambered apparatus, recovering an aqueous solution of chlorine dioxide from said removed mixture,

maintaining substantially steady state conditions in said reaction medium by continuously feeding said sodium chlorate, methanol and sulphuric acid into said reaction medium to make up chemicals consumed in said reducing step and to maintain a total acid normality in said reaction medium in excess of about 9 normal,

maintaining the liquid level in said single-chambered apparatus substantially constant by balancing water fed to the single-chambered apparatus with water removed therefrom,

continuously depositing sodium bisulphate or sesquisulphate from said reaction medium after the reaction medium becomes saturated thereby after the initial start up of the process, and

removing said deposited sodium bisulphate or sesquisulphate from said single-chambered apparatus.

4,081,521

PROCESS FOR CONTINUOUSLY PRODUCING ANHYDROUS SODIUM DITHIONITE

Kousuke Yamamoto; Ahinji Takenaka, and Kazuo Maeda, all of Ohmuta, Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Filed May 5, 1976, Ser. No. 683,671

Claims priority, application Japan, May 13, 1975, 50-50718; Sep. 2, 1975, 50-105588

Int. Cl.² C01B *17/66*

U.S. Cl. 423—515 **11 Claims**

1. A process for continuously producing anhydrous sodium dithionite by the reaction between formic acid or sodium formate, sodium hydroxide and sulfurous acid anhydride in hydrous methanol in at least two reactors, said process comprising introducing into a first reactor a reaction mixture comprising all the sulfurous acid anhydride, formic acid or sodium formate, sodium hydroxide, methanol and water used to effect the production of anhydrous sodium dithionite, maintaining said reaction mixture in said first reactor at temperature of from 60° to 80° C. and for a residence time sufficient to convert from about 25 to 50% of the sulfurous acid anhydride to sodium dithionite wherein the pH of the reaction mixture in said first reactor is maintained in the range of 4.6 to 5.1; feeding the reaction mixture, at the end of said residence time, into a second reactor; maintaining the temperature of the reaction mixture in said second reactor at a temperature higher than that of said first reactor, in the temperature range of from 75° to 87° C, for a residence time from 1 to 4 hours whereby the pH of the reaction mixture in said second reactor is maintained at at least 5.5.

4. A process for continuously producing anhydrous sodium dithionite by the reaction between formic acid or sodium formate, sodium hydroxide and sulfurous acid anhydride in hydrous methanol in at least three reactors, said process comprising introducing into a first reactor a reaction mixture comprising all the formic acid or sodium formate, sodium hydroxide, methanol and water used to effect the production of anhydrous sodium dithionite, and from 60 to 97% by weight of the amount of sulfurous acid anhydride that is required to react with said formic acid or sodium formate, and sodium hydroxide in hydrous methanol, that is added to the first reactor;

maintaining said reaction mixture in said first reactor at a temperature of from 60° to 80° C. and for a residence time sufficient to convert from about 25 to 50% of the sulfurous acid anhydride to sodium dithionite whereby the pH of the reaction mixture in said first reactor is maintained at at least 4.8; feeding the reaction mixture, at the end of said residence time, and the remaining 40 to 3% by weight of the sulfurous acid anhydride, that is required to react with said formic acid or sodium formate, and sodium hydroxide in hydrous methanol, that is added to the first reactor, into a second reactor;

maintaining the temperature of the reaction mixture in said second reactor at a temperature higher than that of said first reactor, in the temperature range of from 70° to 85° C, for a residence time sufficient to convert from about 45 to about 65% of the sulfurous acid anhydride that is required to react with said formic acid or sodium formate, and sodium hydroxide in hydrous methanol that is added to the first reactor to sodium dithionite, wherein the pH of the reaction mixture in said second reactor is maintained at at least 4.9;

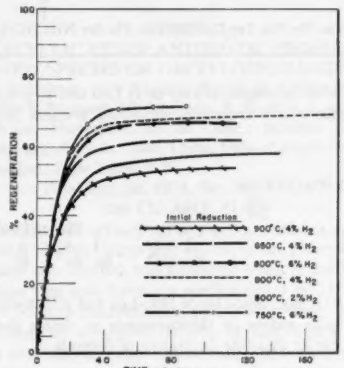
feeding the reaction mixture from said second reactor, at the end of said residence time, into a third reactor; and

maintaining the temperature of the reaction mixture in said third reactor at a temperature higher than that of said second reactor, in the temperature range of from 80° to 88° C, for a residence time of from 1 to 3 hours.

4,081,522
REGENERATION OF SULFATED METAL OXIDES AND CARBONATES

Bill R. Hubble, Plainfield; Stanley Siegel, Downers Grove, and Paul T. Cunningham, Naperville, all of Ill., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Oct. 7, 1976, Ser. No. 730,751
Int. Cl.² C01B *17/42*; B01J *17/00*
U.S. Cl. 423—542 **5 Claims**



CaSO4—CaS REACTION FOR 1.1 CaSO4/CaS MOLE RATIO MATERIAL.

1. A process for the regeneration of sulfated calcium oxide comprising contacting at a temperature of about 700°–800° C., solid particles containing calcium sulfate and calcium oxide with a reductant gas at a concentration of 2% to 8% by volume within an inert diluent gas to react with only a portion of said solid calcium sulfate and thereby produce solid calcium sulfide in intimate mixture with remaining calcium sulfate; and subsequently contacting said particles at a temperature of 900°–1000° C. with a reductant gas of not more than 0.1 volume % within said inert diluent gas to further reduce calcium sulfate to calcium sulfide in a neutral to slightly reducing atmosphere while simultaneously reacting said solid metal sulfate with said solid metal sulfide within said particles to produce SO_2 gas and regenerated calcium oxide.

4,081,523
METHOD FOR THE PRODUCTION OF GALLIUM OXIDE

Heimer Pfundt, Bonn; Manfred Fuchs, Kardorf, and Paul Voib, Bonn, all of Germany, assignors to Vereinigte Aluminium-Werke Aktiengesellschaft, Bonn, Germany

Filed Apr. 19, 1976, Ser. No. 678,233
Claims priority, application Germany, Apr. 18, 1975, 2517292
Int. Cl.² C01G *15/00*
U.S. Cl. 423—624 **7 Claims**

1. A method for the production of gallium oxide (Ga_2O_3) having a purity of >99% which comprises charging a predetermined weight of gallium metal and a quantity of distilled water exceeding the weight of said gallium into an autoclave lined with a synthetic fluorinated hydrocarbon polymer,

sealing said autoclave, reacting said gallium with water vapor at a pressure of about 200–300 bar and a temperature above 200° C to form gallium hydroxide of the formula $Ga(OH)_3$, removing said hydroxide from said autoclave and calcining said hydroxide at a temperature above 600° C to form said gallium oxide.

4,081,524
MANUFACTURE OF COMPLEX HYDRIDES

Eugene C. Ashby, Atlanta, Ga., assignor to Ethyl Corporation, Richmond, Va.

Division of Ser. No. 545,114, Jan. 29, 1975, Pat. No. 4,045,545, which is a continuation of Ser. No. 221,075, Jan. 26, 1972, abandoned, which is a continuation-in-part of Ser. No. 751,862, Jul. 30, 1958, abandoned. This application May 23, 1977, Ser. No. 799,222
Int. Cl.² C01B *6/24*
U.S. Cl. 423—644 **8 Claims**

1. The process for the manufacture of alkali metal aluminum tetrahydrides in solid, readily filterable form comprising pressure hydrogenating at a temperature of about 50° C to 250° C, a mixture consisting essentially of aluminum, an alkali metal, and an organic liquid reaction medium stable at reaction conditions, said medium being selected from the class consisting of aliphatic hydrocarbons and aromatic hydrocarbons, said pressure hydrogenating being carried out in the presence of a catalyst selected from the group consisting of alkyl compounds of metals of Group I-A, II-A, and III-A of the periodic table, said catalyst being in proportions of up to about 5 weight percent of the reaction medium, thereby forming an alkali metal aluminum tetrahydride consisting of aluminum, the alkali metal and hydrogen in solid form and recovering said solid.

4,081,525
RADIOIMMUNOASSAY OF PLASMA STEROIDS

William S. Knight, Laguna Beach, and Barbara J. Kelley, Upland, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed Aug. 16, 1976, Ser. No. 710,499
Int. Cl.² A61K *43/00*; G01N *33/16*
U.S. Cl. 424—1 **20 Claims**

1. An in vitro radioimmunoassay procedure comprising:

(a) contacting a sample comprising serum proteins and steroids with a solution comprising a solvent and a solute, said solute comprising labeled steroids and specific binders for said steroids, and said solvent comprising from about 0 to about 10% by weight of a water miscible organic solvent and from about 90 to about 100% of a buffer having a pH of from about 3 to about 6, whereby the serum proteins are simultaneously inactivated while labeled and unlabeled steroids compete for binding sites on said steroid specific binders;

(b) separating bound steroids from unbound steroids into two fractions; and

(c) measuring one of said fractions for the presence of labeled steroids.

4,081,526
DENTIFRICE COMPOSITION

Toshiro Asakawa, Funabashi; Atsuo Ishida, Chiba, and Shizuo Hayashi, Saitama, all of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Oct. 20, 1976, Ser. No. 734,131
Claims priority, application Japan, Nov. 7, 1975, 50-133892
Int. Cl.² A61K *7/18*
U.S. Cl. 424—57 **7 Claims**

1. A dentifrice composition containing from 0.5 to 5.0 weight percent of an alkali metal phosphate, and from 0.5 to 13 percent by weight of a substance selected from the group consisting of

(a) montmorillonite having the composition, in terms of percent by weight, calculated on an anhydrous basis,

SiO_2	60.0 to 70.0

-continued

MgO	2.0 to 5.0
Fe_2O_3	zero to 2.0
Al_2O_3	20.0 to 30.0
Na_2O	2.0 to 5.0

and

(b) hectorite having the composition, in terms of percent by weight, calculated on an anhydrous basis,

SiO_2	50.0 to 65.0 wt.%
Na_2O	2.5 to 5.0 wt.%
Fe_2O_3	zero to 2.0 wt.%
MgO	20.0 to 30.0 wt.%
Li_2O	0.6 to 2.0.

4,081,527
CHLORTETRACYCLINE COMPOSITIONS

William W. Armstrong, Mill Neck, N.Y., and Saurabhkumar J. Desai, Groton, Conn., assignors to Pfizer Inc., New York, N.Y.

Filed Dec. 7, 1976, Ser. No. 748,175

The portion of the term of this patent subsequent to Apr. 19, 1994, has been disclaimed.

Int. Cl.² A61K *31/79, 31/65*

U.S. Cl. 424—80 **8 Claims**

1. A chlortetracycline composition comprising an aqueous solution of from about 5 to 20% by weight of an antibiotic compound selected from the group consisting of chlortetracycline and the pharmaceutically acceptable acid addition salts thereof, from about 2 to 4 molar proportions based on said antibiotic of a pharmaceutically acceptable calcium compound soluble in said solution, and from about 50 to 70% by weight of 2-pyrrolidone, said composition having a pH value in the range of from about 8 to 10.

4,081,528
TETRACYCLINE COMPOSITIONS

William W. Armstrong, Mill Neck, N.Y., assignor to Pfizer Inc., New York, N.Y.

Continuation-in-part of Ser. No. 646,295, Feb. 2, 1976, Pat. No. 4,018,889. This application Dec. 7, 1976, Ser. No. 748,355

The portion of the term of this patent subsequent to Apr. 19, 1994, has been disclaimed.

Int. Cl.² A61K *31/79, 31/65*

U.S. Cl. 424—80 **8 Claims**

1. A tetracycline composition comprising an aqueous solution of from about 1 to 15% by weight of an antibiotic compound selected from the group consisting of tetracycline and the pharmaceutically acceptable acid addition salts thereof, from about 0.8 to 1.3 molar proportions based on said antibiotic of a pharmaceutically acceptable magnesium compound solube in said solution, and from about 10 to 70% by weight of 2-pyrrolidone, said composition having a pH value in the range of from about 7.5 to 9.5.

4,081,529
POLYHYDROXYPHENYLCHROMANONES

Felice Crippa, Milan, Italy, assignor to Inverni Della Beffa S.P.A., Milan, Italy

Filed May 2, 1977, Ser. No. 792,986

Claims priority, application United Kingdom, May 5, 1976, 18415/76

Int. Cl.² A61K *31/79, 35/78, 31/35*

U.S. Cl. 424—80 **18 Claims**

1. A process for producing a stable, water-soluble pharmaceutical product of one or more polyhydroxyphenyl chromanones selected from the group consisting of silybine, silydianine, silycristine and natural and reconstituted mixtures thereof which comprises forming a solution comprising said polyhydroxyphenyl chromanone and polyvinylpyrrolidone of molecular weight in the range from 3,000 to 40,000 in a solvent consisting essentially of water and a water-soluble organic solvent, the weight ratio of polyvinylpyrrolidone to polyhydroxyphenyl chromanone being from 0.1:1 to 4:1, and lyophilizing said solution.

4,081,530
EXTENDED CHAIN DERIVATIVES OF SOMATOSTATIN

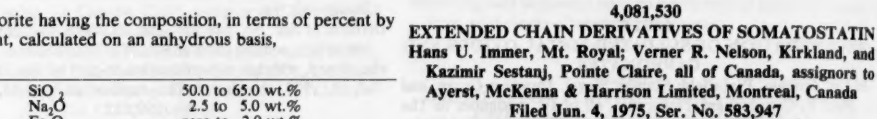
Hans U. Immer, Mt. Royal; Verner R. Nelson, Kirkland, and Kazimir Sestanj, Pointe Claire, all of Canada, assignors to Ayerst, McKenna & Harrison Limited, Montreal, Canada

Filed Jun. 4, 1975, Ser. No. 583,947

Int. Cl.² A61K *37/00;* **C07C** *103/52*

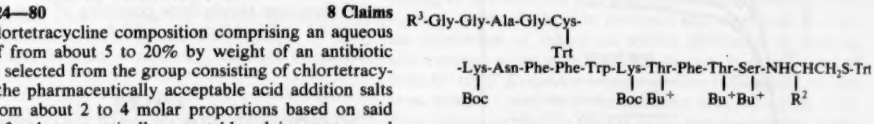
U.S. Cl. 424—177 **27 Claims**

1. A process for preparing a peptide of formula I

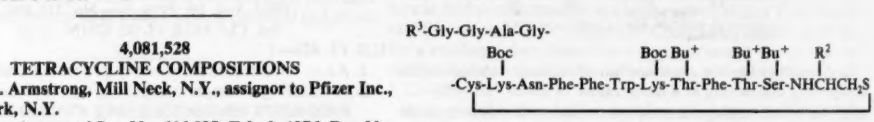


(I)

in which R^1 is hydrogen, H-Gly or H-Leu and R^2 is hydrogen or carboxyl, which comprises: oxidizing a linear peptide of formula



in which R^3 is Boc, Boc-Gly or Boc-Leu and R^2 is hydrogen or carboxyl with iodine or thiocyanogen to obtain the corresponding cyclic disulfide derivative of formula



in which R^2 and R^3 are as defined herein and subsequently removing all remaining protecting groups under moderately acidic conditions to obtain the corresponding peptide of formula I; or followed by subjecting said linear peptide to treatment with either mercuric acetate, mercuric chloride, silver acetate or silver nitrate to remove selectively the sulfhydryl protecting groups to obtain the mercuric or disilver salt, respectively, of the corresponding disulfhydryl derivative; converting the latter salt to its corresponding free disulfhydryl derivative by treatment with hydrogen sulfide, oxidizing said last-named disulfhydryl derivative by treatment with oxygen, 1,2-diiodoethane, sodium or potassium ferricyanide or iodine to obtain the corresponding cyclic disulfide derivative and removing the remaining protecting groups under moderately acidic conditions and isolating the desired peptide of formula I.

4,081,531
ANTIBIOTIC MIMOSAMYCIN

Tadashi Arai, Kojimachi Sanbancho Kondo 401, 3-2, Sanbancho, Chiyoda, Tokyo, Japan

Division of Ser. No. 720,823, Sep. 7, 1976. This application Apr. 18, 1977, Ser. No. 788,698

Claims priority, application Japan, Sep. 19, 1975, 50-113289

Int. Cl.² A61K *35/74*

U.S. Cl. 424—121 **1 Claim**

1. An antibiotic substance mimosamycin, said substance being a neutral yellow prism form which has a melting point of 227° – 231° C.; a composition of 61.51% carbon, 4.79% hydrogen and 5.87% nitrogen; a molecular weight of 233 according

to mass spectrum; an empirical formula of $C_{12}H_{11}NO_4$; an ultraviolet absorption spectrum shown in FIG. 1 UV λ_{max}^{MeOH} nm (logϵ): 230 (shoulder) (4.16) 317 (4.14), 396(3.56), UV λ_{min}^{MeOH} nm (logϵ): 277 (3.78), 370(3.53); an infrared absorption spectrum shown in FIG. 2, IR ν_{max}^{KBr} cm^{-1}: 1685, 1655, 1635, 1585, an NMR spectrum ($CDCl_3$) shown in FIG. 3, δ: 2.10 (3H, s.), 3.69 (3H, s.), 4.20 (3H, s.), 7.12 (1H, s.), 8.28 (1H, s.); a rotary dispersion spectrum (C = 4.37 × 10^7, MeOH) of $[\Phi]^{20}$ (nm): -1601 (500), -1373 (490), -1373 (480), -1144 (470), -1144 (460), -1144 (450 - 390), -1373 (380), -1144 (370 -350), -1373 (340), -1831 (330), -2288 (320), -2288 (310), -1831 (300), -1601 (290), -2059 (280), -2517 (270), -3661 (260), -5492 (250); and is easily soluble in methanol, ethanol, chloroform, an ester and acetone, sparingly soluble in ethyl ether and n-hexane and insoluble in water; and positive to Ehrlich reagent and negative to ninhydrin and Dragendorff reagent.

4,081,532

POLYCYCLIC ETHER ANTIBIOTIC PRODUCED BY NEW SPECIES OF DACTYLOSPORANGIUM

Walter D. Celmer, New London; Walter P. Cullen, East Lyme; Charles E. Moppett, Mystic; John B. Routien, Lyme; Mark T. Jefferson, Waterford, all of Conn.; Riichiro Shibakawa, Handa, and Junsuke Tone, Chita, both of Japan, assignors to Pfizer Inc., New York, N.Y.

Filed Sep. 20, 1976, Ser. No. 724,869
Int. Cl.[2] A61K *35/00*
U.S. Cl. 424—122 **8 Claims**

1. The antibiotic Compound 44,161, or the pharmaceutically acceptable salts thereof, said antibiotic when in the form as the crystalline free acid having a melting point of 155°-157° C.; $\alpha_D = -10°$ at a concentration of 1% in acetone; an average composition by weight of 69.24% carbon, 9.12% hydrogen and 21.64% oxygen (by difference); ultraviolet absorption maxima in methanol at 246 and 313 nm with $E_1^{1\%}{}_{cm}$ values of 76 and 51, respectively; and, when pelleted in KBr, exhibiting characteristic absorption in the infrared region at the following wavelengths in microns: 2.97, 3.44, 5.80, 6.05, 6.18, 6.30, 6.87, 7.09, 7.28, 7.85, 8.07, 8.65, 9.08, 9.63, 10.20, 10.50, 10.94 and 12.33.

4,081,533

METHOD OF REDUCING MAMMALIAN FERTILITY AND DRUGS THEREFOR

Dean W. Cheesman, Kentfield, Calif., assignor to Regents of the University of California, Berkeley, Calif.

Filed Sep. 1, 1976, Ser. No. 719,659
Int. Cl.[2] A61K *37/00*; C07C *103/52*
U.S. Cl. 424—177 **17 Claims**

1. A method for reducing fertility in female mammals by suppressing the pre-ovulatory surge of luteinizing hormone with resultant inhibition of ovulation and fertility, comprising introducing into the mammal during the pre-ovulatory period an effective amount of a cyclic nonapeptide having the formula:

Cys-Tyr-Ileu-Glu(NH_2)-Asp(NH_2)-Cys-Pro-Arg-Gly(NH_2).

6. A method for reducing fertility in a female mammal by suppressing the pre-ovulatory surge of luteinizing hormone with resultant inhibition of ovulation and fertility, comprising introducing into the mammal during the pre-ovulatory period an effective amount of a tripeptide having the formula:

Pro-Arg-Gly(NH_2).

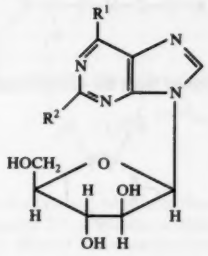
4,081,534

AMINO PURINE NUCLEOSIDES AS AUTOIMMUNE SUPPRESSANT AGENTS

Gertrude B. Elion, Chapel Hill, N.C., and Robert A. Strelitz, Edison, N.J., assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

Continuation of Ser. No. 396,238, Sep. 11, 1973, abandoned, which is a continuation of Ser. No. 226,328, Feb. 14, 1972, abandoned, which is a division of Ser. No. 877,443, Nov. 17, 1969, Pat. No. 3,666,856. This application Jul. 26, 1976, Ser. No. 708,346
The portion of the term of this patent subsequent to May 30, 1989, has been disclaimed.
Int. Cl.[2] A61K *31/52*; C07H *19/16*
U.S. Cl. 424—180 **20 Claims**

1. A method of treating a mammal suffering from an autoimmune disease which comprises internally administering to the mammal an effective autoimmune suppressant amount of the compound of the formula or its pharmaceutically acceptable salts



where R^1 is amino or loweralkylamino and R^2 is amino or hydrogen, provided that when R^1 is amino, R^2 is amino.

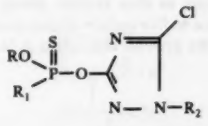
4,081,535

O-ALKYL-O-[5-CHLORO-1,2,4-TRIAZOL(3)yl]-THIONO(THIOL)-PHOSPHORIC (PHOSPHONIC) ACID ESTERS AND ESTER-AMIDES

Rainer Alois Fuchs, Wuppertal; Ingeborg Hammann, Cologne; Wolfgang Behrenz, Overath, and Bernhard Homeyer, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Oct. 21, 1976, Ser. No. 734,500
Claims priority, application Germany, Oct. 27, 1975, 2547971
Int. Cl.[2] A01N *9/36, 13/00*; C07F *9/65*
U.S. Cl. 424—200 **10 Claims**

1. An O-alkyl-O-[5-chloro-1,2,4-triazol(3)yl]-thiono(thiol)-phosphoric(phosphonic) acid ester or ester-amide of the formula



in which

R is alkyl with 1 to 6 carbon atoms,

R_1 is alkyl, alkoxy, alkylthio or monoalkylamino, each with 1 to 6 carbon atoms, and

R_2 is alkylthioalkyl with 1 to 4 carbon atoms per alkyl radical, alkenyl with 2 to 5 carbon atoms, carbalkoxyalkyl with 1 to 4 carbon atoms per alkyl radical, 1-methyl-2-cyanoethyl, or phenoxyalkyl with 1 to 4 carbon atoms in the alkyl radical and optionally substituted on the phenyl radical by at least one of halogen, cyano, or alkylthio or alkyl each with 1 to 4 carbon atoms.

9. A method of combating nematodes or arthropods which

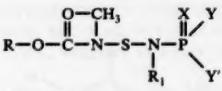
comprises applying to the nematodes or arthropods, or to a habitat thereof, a nematicidally or arthropodicidally effective amount of a compound according to claim 1.

4,081,536
N-[(PHOSPHINYL) AMINO]THIO- AND N-[(PHOSPHINOTHIOYL)AMINO]-THIO-METHYLCARBAMATES AND METHODS FOR CONTROLLING INSECTS

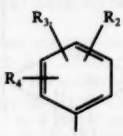
Stephen J. Nelson, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Feb. 4, 1977, Ser. No. 765,807
Int. Cl.[2] A01N 9/36; C07F 9/24
U.S. Cl. 424—211 **64 Claims**

1. N-[(phosphinyl)amino]thio- and N-[(phosphinothioyl-)amino]-thio-methylcarbamates represented by the schematic formula



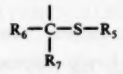
wherein, R is selected from the group consisting of

a. 

wherein R_2, R_3, and R_4 are the same or different and are selected from the group consisting of hydrogen, lower-alkyl of one to five carbon atoms, inclusive, halogen, lower-alkoxy of one to five carbon atoms, inclusive, lower-alkylthio of one to five carbon atoms, inclusive, dialkylamino with each alkyl the same or different and having one to three carbon atoms, inclusive, and $-N{=}CHN(CH_3)_2$; and

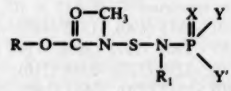
b.

wherein A and B are the same or different and are selected from the group consisting of lower-alkyl of one to five carbon atoms, inclusive, lower-alkylthio of one to five carbon atoms, inclusive, monocyano substituted alkylthio of one to five carbon atoms, inclusive, phenylthio wherein phenyl is unsubstituted or substituted with one to three substituents, same or different, selected from the group consisting of halogen and lower-alkyl of one to four carbon atoms, inclusive, cyano, alkoxy having one to five carbon atoms, inclusive, phenyl, and hydrogen with the proviso that when A is hydrogen, B is of the formula

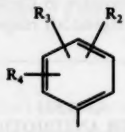


wherein R_5 is selected from the group consisting of alkyl of one to three carbon atoms, inclusive, and phenyl; R_6 is alkyl of one to three carbon atoms, inclusive; R_7 is selected from the group consisting of alkyl of one to three carbon atoms, inclusive, and SR_8, wherein R_8 is alkyl and is the same alkyl group as R_5; R_1 is selected from the group consisting of lower-alkyl, phenyl, substituted phenyl, phenlower-alkyl and cycloalkyl; X is oxygen or sulfur; and Y and Y′ are the same or different and are selected from the group consisting of lower-alkyl, lower-alkoxy, lower-alkylthio, cycloalkyl, phenyl, substituted phenyl, phenoxy, substituted phenoxy, thiophenoxy and substituted thiophenoxy.

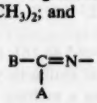
46. The method for controlling insect pests which comprises contacting susceptible insect pests with an effective amount of N-[(phosphinyl)amino]thio- and N-[(phosphinothioyl)amino]-thiomethylcarbamates represented by the schematic formula



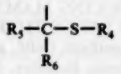
wherein R is selected from the group consisting of

a. 

wherein R_2, R_3, and R_4 are the same or different and are selected from the group consisting of hydrogen, lower-alkyl of one to five carbon atoms, inclusive, halogen, lower-alkoxy of one to five carbon atoms, inclusive, lower-alkylthio of one to five carbon atoms, inclusive, dialkylamino with each alkyl the same or different and having one to three carbon atoms, inclusive, and $-N{=}CHN(CH_3)_2$; and

b. 

wherein A and B are the same or different and are selected from the group consisting of hydrogen, lower-alkyl of one to five carbon atoms, inclusive, lower-alkylthio of one to five carbon atoms, inclusive, monocyano substituted alkylthio of one to five carbon atoms, inclusive, phenylthio wherein phenyl is unsubstituted or substituted with one to three substituents, same or different, selected from the group consisting of halogen and lower-alkyl of one to four carbon atoms, inclusive, cyano, alkoxy having one to five carbon atoms, inclusive, phenyl, and hydrogen, with the provisio that when B is hydrogen, A is of the formula



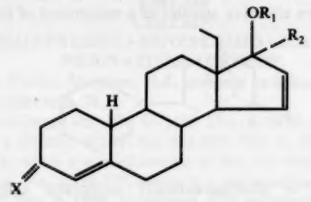
wherein R_5 is selected from the group consisting of alkyl of one to three carbon atoms, inclusive, and phenyl; R_6 is alkyl of one to three carbon atoms, inclusive; and phenyl; R_6 is alkyl of one to three carbon atoms, inclusive; R_7 is selected from the group consisting of alkyl of one to three carbon atoms, inclusive, and SR_8, wherein R_8 is alkyl and is the same alkyl group as R_5.

4,081,537
Δ^{15}-STEROIDS AND PHARMACEUTICAL COMPOSITIONS THEREOF

Helmut Hofmeister; Rudolf Wiechert; Klaus Annen; Henry Laurent, and Hermann Steinbeck, all of Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Germany

Filed Oct. 4, 1976, Ser. No. 728,896
Claims priority, application Germany, Oct. 10, 1975, 2546062; Aug. 12, 1976, 2636407; Aug. 12, 1976, 2636404; Aug. 12, 1976, 2636405
Int. Cl.[2] C07J 1/00; A61K 31/56
U.S. Cl. 424—238 **53 Claims**

1. A Δ^{15}-steroid of the formula



wherein R_1 is a hydrogen atom, trialkylsilyl wherein each alkyl is of 1–4 carbon atoms, or alkanoyl or alkanesulfonyl of 1–16 carbon atoms; R_2 is ethynyl, chloroethynyl or propinyl; and X is an oxygen atom,

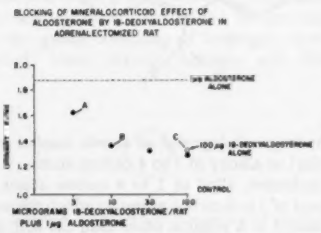
or NOR_4, wherein R_3 is a hydrogen atom, alkanoyl or alkanesulfonyl of 1–16 carbon atoms, and R_4 is a hydrogen atom, alkanoyl of 2–8 carbon atoms, alkyl of 1–4 carbon atoms or cycloalkyl of 3–8 carbon atoms.

52. A pharmaceutical composition comprising a progestationally effective amount per unit dosage of a compound of claim 1, in admixture with a pharmaceutically acceptable carrier.

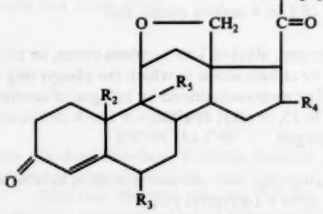
4,081,538
ALDOSTERONE ANTAGONISTS

Stanley Ulick, 38 Crane Rd., Scarsdale, N.Y. 10583

Filed Dec. 2, 1976, Ser. No. 746,847
Int. Cl.[2] A61K *31/58*; C07J *17/00*
U.S. Cl. 424—241 **4 Claims**


BLOCKING OF MINERALOCORTICOID EFFECT OF ALDOSTERONE BY 18-DEOXYALDOSTERONE IN ADRENALECTOMIZED RAT
3 µg ALDOSTERONE ALONE
100 µg 18-DEOXYALDOSTERONE ALONE
CONTROL
MICROGRAMS 18-DEOXYALDOSTERONE/RAT PLUS 1 µg ALDOSTERONE

1. A method for inhibiting the effect of mineralocorticoids on sodium excretion which comprises administering to a patient as 11β,18-oxidopregnane having the formula:



wherein:

R_2, R_3 and R_4 are each hydrogen or lower alkyl,

R_5 is hydrogen or halo, and

R_8 is hydrogen, hydroxy or an ether or ester group OR_9 wherein R_9 is lower alkyl or acyl;

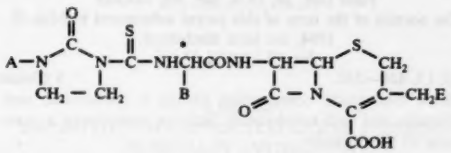
in an amount sufficient to counteract the salt-retaining effects of aldosterone.

4,081,539
PENICILLINS AND CEPHALOSPORINS AND THEIR PRODUCTION

Hans-Bodo König; Karl Georg Metzger, and Wilfried Schröck, all of Wuppertal, Germany, assignors to Bayer Aktiengesellschaft, Germany

Division of Ser. No. 643,550, Dec. 22, 1975, Pat. No. 4,039,673, which is a division of Ser. No. 518,178, Oct. 25, 1974, Pat. No. 3,966,709. This application Jan. 31, 1977, Ser. No. 763,728
Claims priority, application Germany, Oct. 30, 1973, 2354219
Int. Cl.[2] A61K *31/545*
U.S. Cl. 424—246 **11 Claims**

8. The method of combatting bacterial infections in humans and other animals which comprises administering to said human or animals an antibacterially effective amount of a compound selected from the group consisting of a 2-oxoimidazolidine of the formula:



and the pharmaceutically acceptable salts thereof wherein the carbon atom designated C* constitutes a center of chirality;

A is hydrogen or alkyl of 1 to 4 carbon atoms;

B is phenyl, methylphenyl, chlorophenyl, hydroxyphenyl or cyclohexa-1,4-dien-1-yl; and

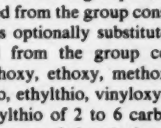
E is hydrogen, hydroxy or acetoxy.

4,081,540
1-MORPHOLINOCARBONYL IMIDAZOLES

Maurice W. Baker; John C. Kerry; Antonin Kozlik; John R. Marshall; Kenneth J. Nichol, and David M. Weighton, all of Nottingham, England, assignors to The Boots Company Limited, Nottingham, England

Division of Ser. No. 523,774, Nov. 14, 1974, Pat. No. 3,996,366, which is a continuation-in-part of Ser. No. 417,991, Nov. 21, 1973, Pat. No. 3,940,484, which is a continuation-in-part of Ser. No. 311,009, Nov. 30, 1972, Pat. No. 3,868,458. This application Sep. 27, 1976, Ser. No. 727,317
Claims priority, application United Kingdom, Dec. 7, 1971, 53621/71
Int. Cl.[2] C07D *413/02*; A01N *9/24, 9/22*
U.S. Cl. 424—248.51 **10 Claims**

1. A compound of the formula



in which X is selected from the group consisting of oxygen and sulphur, R^3 is selected from the group consisting of alkylthio of 1 to 6 carbon atoms optionally substituted with at least one substituent selected from the group consisting of chloro, bromo, fluoro, methoxy, ethoxy, methoxy carbonyl, ethoxy carbonyl, methylthio, ethylthio, vinyloxy, dimethylamino and diethylamino, alkenylthio of 2 to 6 carbon atoms optionally substituted with one to two halo substituents selected from the group consisting of bromo, fluoro and chloro, benzylthio optionally substituted with one or more substituents selected from the group consisting of methyl, nitro, methoxy, trifluoromethyl and chloro, alkoxyalkyl containing 2 to 5 carbon atoms,

and alkylthioalkyl containing 2 to 5 carbon atoms; R^4 is selected from the group consisting of alkyl of 1 to 10 carbon atoms and cycloalkyl of 3 to 7 carbon atoms optionally substituted with 1 to 3 methyl groups; and R^1 and R^2, together with the nitrogen atom to which they are attached, form a morpholino group optionally containing 1 to 4 lower alkyl substituents; and salts thereof of acids selected from the group consisting of hydrochloric, hydrobromic, hydroiodic, hydrofluoric, sulphuric, nitric, phosphoric, perchloric, sulphamic, formic, acetic, trichloracetic, oxalic, picric, benzenesulphonic, dodecylbenzenesulphonic, p-toluenesulphonic, stearic, flavianic, embonic and tetraiodophthalic acids.

9. A method of combating insects which comprises applying to said insects or the locus thereof an insecticidally effective amount of a compound according to claim 1.

4,081,541

STEROID DERIVATIVES

Aldo Bertelli, Milan, Italy, assignor to Rorer Italiana S.p.A., Milan, Italy

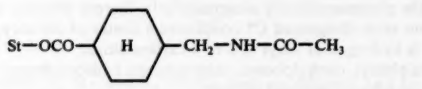
Filed Dec. 28, 1976, Ser. No. 755,015

The portion of the term of this patent subsequent to Mar. 8, 1994, has been disclaimed.

Int. Cl.[2] A61K *31/56*

U.S. Cl. 424—243 **5 Claims**

4. A therapeutic composition having a corticoidal, antiphlogistic and anti-anaphylactic activity comprising a compound of the formula:



(I)

in which:

St represents a radical selected from 9-chloro-11β,17,21-trihydroxy-16β-methyl-pregna-1,4 diene-3,20 dione and 9-fluoro-11β,17,21-trihydroxy-16α-methyl-pregna-1,4 diene-3,20 dione, the ester linkage being at position 21 of the steroid group, in admixture with a therapeutically acceptable vehicle.

5. A composition according to claim 4, in unit dosage form.

4,081,542

PIPERAZINYLPYRAZINES

William C. Lumma, Jr., Lansdale, and Walfred S. Saari, Pennsburg, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

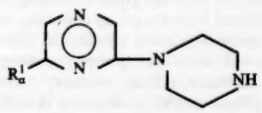
Continuation-in-part of Ser. No. 696,254, Jun. 15, 1976, abandoned, which is a continuation-in-part of Ser. No. 656,664, Feb. 9, 1976, abandoned, which is a continuation-in-part of Ser. No. 570,052, Apr. 21, 1975, abandoned. This application Mar. 4, 1977, Ser. No. 774,565

The portion of the term of this patent subsequent to Apr. 14, 1995, has been disclaimed.

Int. Cl.[2] C07D *295/12;* A61K *31/495*

U.S. Cl. 424—250 **4 Claims**

1. A compound of the formula:

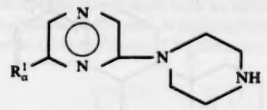


or an N-oxide

or pharmaceutically acceptable salt thereof, wherein

R_a^1 is trifluoromethyl, alkoxy of from 1–4 carbon atoms, or, alkylthio of 1–4 carbon atoms.

4. The pharmaceutical composition for decreasing food intake in a mammalian species comprising a pharmaceutical carrier and an effective amount of a compound of formula:



or N-oxide or pharmaceutically acceptable salt thereof, wherein

R_a^1 is trifluoromethyl, alkoxy of from 1–4 carbon atoms, alkylthio of 1–4 carbon atoms.

4,081,543

5-SUBSTITUTED-1,2,3,4-TETRAHYDROBENZO[g-]ISOQUINOLINES

Jean-Michel Bastian, Therwil, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

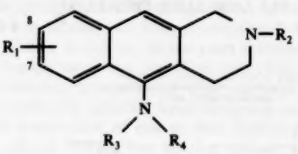
Filed Jun. 7, 1976, Ser. No. 693,704

Claims priority, application Switzerland, Jun. 13, 1975, 7688/75; Jun. 13, 1975, 7689/75; Jun. 13, 1975, 7691/75

Int. Cl.[2] C01D *221/08;* A01K *31/47*

U.S. Cl. 424—258 **27 Claims**

1. A compound of formula I,



I

wherein

R_1 is hydrogen, halogen of an atomic number from 9 to 35, or alkyl or alkoxy of 1 to 4 carbon atoms,

R_2 is hydrogen, alkyl of 1 to 4 carbon atoms, alkenyl or alkynyl of 3 to 6 carbon atoms, in which the multiple bond is located in a position other than the α,β position, hydroxyalkyl of 2 to 5 carbon atoms in which the hydroxy group is separated from the nitrogen atom of the tricyclic ring system by at least 2 carbon atoms, alkanoylalkyl of 3 to 5 carbon atoms, or phenylalkyl of 7 to 10 carbon atoms in which the phenyl ring is unsubstituted or monosubstituted by halogen of atomic number 9 to 35, or alkyl or alkoxy of 1 to 4 carbon atoms, and

either

R_3 is hydrogen, alkyl of 1 to 4 carbon atoms, or phenylalkyl of 7 to 10 carbon atoms in which the phenyl ring is unsubstituted or mono-substituted by halogen of atomic number from 9 to 35, or alkyl or alkoxy of 1 to 4 carbon atoms, and

R_4 is hydrogen,

or

R_3 and R_4 together with the nitrogen atom to which they are bound form a 1-pyrrolyl ring,

in the form of the free base or in the form of a pharmaceutically acceptable acid addition salt thereof.

5. A pharmaceutical composition comprising an anti-aggressive or anti-excitation effective amount of a compound according to claim 1 in association with a pharmaceutical carrier or diluent.

4,081,544
CERTAIN 2-(ALPHA(2-PYRIDYL)-BENZYL)IMIDAZOLINES AND DERIVATIVES THEREOF

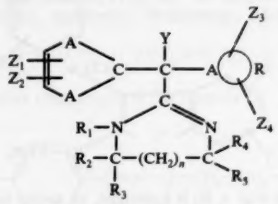
Lewis A. Walter, Madison, N.J., assignor to Schering Corporation, Kenilworth, N.J.

Continuation of Ser. No. 637,498, Dec. 4, 1975, abandoned, which is a division of Ser. No. 412,852, Nov. 5, 1973, Pat. No. 3,932,431, which is a continuation of Ser. No. 49,578, Jun. 24, 1970, Pat. No. 3,770,737, which is a continuation of Ser. No. 704,263, Feb. 9, 1968, abandoned. This application Dec. 27, 1976, Ser. No. 754,396

Int. Cl.[2] A61K *31/45, 31/425, 31/495*

U.S. Cl. 424—263 **16 Claims**

1. The process for eliciting an anti-depressant effect which comprises administering to a mammal suffering from mental depression a therapeutically effective quantity of a compound selected from the group consisting of a cyclic amidine of the structural formula:



and a pharmaceutically acceptable acid addition salt thereof, wherein *n* is an integer of the group consisting of zero and one; A is a member of the group consisting of —C=C,—C=N and —S— wherein A together with the ring atoms to which it is attached represents a heterocycle of the group consisting of pyridyl, pyrimidinyl, pyrazinyl and thiazoyl each of Z_1, Z_2, and Z_3 is a member of the group consisting of hydrogen, lower alkyl, trifluoromethyl, lower alkoxy and halogen and Z_4 is a member of the group consisting of hydrogen, lower alkyl, trifluoromethyl, lower alkoxy, halogen and diloweralkylamino;

represents a member of the group consisting of phenyl, thienyl and pyridyl; Y represents a member of the group consisting of hydrogen, lower alkyl, hydroxy, lower alkoxy and lower alkanoyloxy containing 2 to 6 carbon atoms; R_1 represents a member of the group consisting of hydrogen, lower alkyl, aminolower alkyl, hydroxyloweralkyl, benzyl and phenethyl; each of R_2, R_3, R_4 and R_5 are members of the group consisting of hydrogen and lower alkyl.

4,081,545
PENICILLINS

John Peter Clayton, Horsham, England, assignor to Beecham Group Limited, United Kingdom

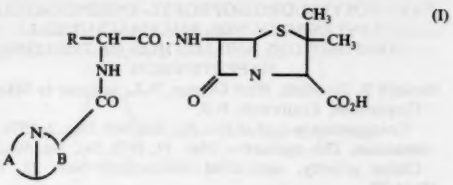
Filed Oct. 29, 1976, Ser. No. 736,897

Claims priority, application United Kingdom, Oct. 31, 1975, 45214/75; Jan. 20, 1976, 2072/76; Apr. 28, 1976, 21514/76

Int. Cl.[2] A61K *31/43;* **C07D** *499/64, 499/68, 499/70*

U.S. Cl. 424—271 **33 Claims**

1. A penicillin of formula (I) or a pharmaceutically acceptable non-toxic salt or conventional penicillin in vivo hydrolysable ester thereof:



(I)

wherein R represents furyl, thienyl, cycloalkyl of up to 6 carbon atoms in the alkyl part, cycloalkenyl of up to 6 carbon atoms in the alkenyl part or phenyl, or phenyl substituted by hydroxy, halogen, nitro, lower alkyl, lower alkoxy, amino, or carboxy; and A and B are the same or different and each represents the residue of a fused 5- or 6-membered ring.

4,081,546
3-SUBSTITUTED AMINOCYCLOALKYL ESTERS OF PENICILLIN ANTIBIOTICS

Harry Ferres, Horsham, England, assignor to Beecham Group Limited, United Kingdom

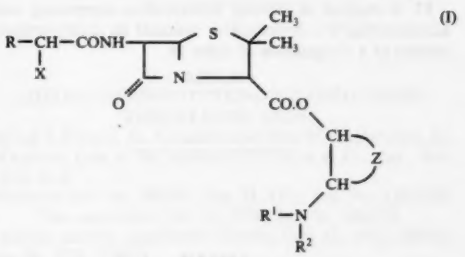
Filed Jun. 20, 1977, Ser. No. 807,977

Claims priority, application United Kingdom, Jun. 24, 1976, 26320/76

Int. Cl.[2] A61K *31/43;* **C07D** *499/68, 499/46, 499/32*

U.S. Cl. 424—271 **8 Claims**

1. A penicillin ester of formula (I) or a pharmaceutically acceptable acid addition salt thereof:



(I)

wherein

R^1 and R^2 are the same or different and each represents a C_{1-6} alkyl group or R^1 and R^2 taken together represents an alkylene chain optionally interrupted with an oxygen or nitrogen atoms forming a 5- or 6-membered heterocyclic ring;

Z represents an optionally substituted straight or branched saturated or unsaturated divalent hydrocarbon radical wherein the optional substituents are selected from the group consisting of C_1–C_6 alkyl, C_1-C_6 alkoxy and halogen;

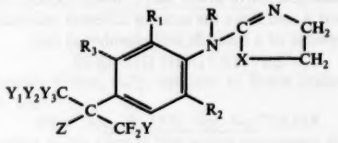
X represents hydrogen, amino, carboxy, alkoxycarbonyl, phenoxycarbonyl, alkylphenoxycarbonyl or indanyl; R represents phenyenoptionally substituted with hydroxy or halogne; naphthyl optionally substituted with C_{1-6} alkoxy; phenoxy optionally substituted with C_{1-6} alkoxy; 2- or 3-thienyl, pyridyl, tetrazolyl, or the group RCHX represents phenyl optionally substituted with C_{1-6} alkoxy or isoxazolyl optionally substituted with halogen or C_{1-6} alkyl.

4,081,547
PARA-POLYFLUOROISOPROPYL-ANILINO-2-OXAZOLINE COMPOUNDS, PHARMACEUTICAL COMPOSITIONS AND METHOD OF TREATING HYPERTENSION

Bernard R. Neustadt, West Orange, N.J., assignor to Schering Corporation, Kenilworth, N.J.

Continuation-in-part of Ser. No. 528,603, Dec. 2, 1974, abandoned. This application Mar. 19, 1976, Ser. No. 668,385
Claims priority, application Switzerland, Nov. 21, 1975, 15164/75
Int. Cl.[2] A61K *31/425, 31/42;* **C07D** *261/00, 275/02*
U.S. Cl. 424—272 **18 Claims**

1. A compound of the formula



(I)

wherein

X is an oxygen atom,

R is alkyl having 1 to 4 carbon atoms,

R_1, R_2 and R_3 are independently hydrogen, bromine, chlorine, fluorine, lower alkyl, lower alkoxy, lower alkanoyloxy or nitro,

Y, Y_1, Y_2 and Y_3 are independently hydrogen, chlorine or fluorine,

Z is independently hydrogen, hydroxy, lower alkoxy, lower alkanoyloxy, chlorine or fluorine, and the pharmaceutically acceptable salts thereof.

14. A pharmaceutical composition adopted to treat hypertension comprising an oral dosage of an antihypertensively effective amount of a compound of claim **1** in a pharmaceutically acceptable diluent.

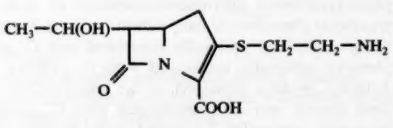
17. A method of treating hypertension comprising orally administering to a hypertensive mammal an antihypertensive amount of a composition of claim **14**.

4,081,548
ANTIBIOTICS

Jean S. Kahan; Frederick M. Kahan, both of Rahway; Edward O. Stapley, Metuchen; Robert T. Goegelman, Linden, all of N.J., and Sebastian Hernandez, Madrid, Spain, assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 632,938, Nov. 18, 1975, Pat. No. 4,006,060, which is a division of Ser. No. 526,992, Nov. 25, 1974, Pat. No. 3,950,357. This application Sep. 3, 1976, Ser. No. 720,483
Int. Cl.[2] A61K *31/40*
U.S. Cl. 424—274 **1 Claim**

1. An antibacterial composition comprising an antibacterial effective amount of the compound:



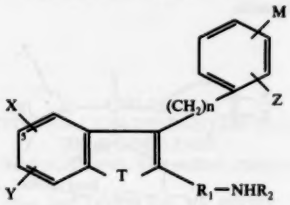
and a non-toxic pharmaceutically acceptable carrier therefore.

4,081,549
ANTIMICROBIAL BENZOTHIOPHENES

Martin Steinman, Livingston, N.J., assignor to Schering Corporation, Kenilworth, N.J.

Division of Ser. No. 640,291, Dec. 12, 1975, Pat. No. 4,018,893, which is a continuation-in-part of Ser. No. 473,625, May 28, 1974, Pat. No. 3,944,672. This application Jan. 12, 1977, Ser. No. 758,739
Claims priority, application United Kingdom, May 22, 1975, 22371/75
Int. Cl.[2] A61K *31/38, 31/34*
U.S. Cl. 424—275 **4 Claims**

1. A method for treating susceptible microbial infections, selected from the group consisting of bacterial, fungal and protozoal infections, which comprises administering to an animal species so infected an antimicrobially effective quantity of a compound represented by the formula:



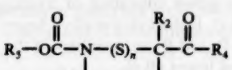
wherein *n* is 0 or 1; R_2 is hydrogen, or amino lower alkylene having 1 to 3 carbon atoms; R_1 is carbonyl or lower alkylene having 1 to 3 carbon atoms with the provisio that when R_2 is hydrogen, R_1 is lower alkylene; T is S; X is halogen, nitro, or trifluoromethyl; Y is hydrogen, halogen, methyl or trifluoromethyl; M is hydrogen, halogen or methyl with the provisio that when X is nitro, M is halogen; Z is hydrogen, halogen, nitro or methyl; or the acid addition salts thereof.

4,081,550
KETOALKANESULFENYL AND KETOALKANETHIOSULFENYL CARBAMATES

Themistocles D. J. D'Silva, South Charleston, W. Va., assignor to Union Carbide Corporation, New York, N.Y.

Filed May 20, 1976, Ser. No. 688,410
Int. Cl.[2] A01N *9/12;* **C07C** *149/12, 149/20*
U.S. Cl. 424—298 **46 Claims**

32. A method of controlling insects, mites, and nematodes which comprises subjecting them to an insecticidally, miticidally or nematocidally effective amount of a compound of the formula:



wherein:

n is 1 or 2,

R_1 is alkyl;

R_2 is alkyl or chlorine;

R_3 is hydrogen, alkyl, phenyl, or alkanoyl;

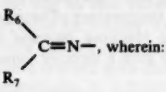
R_4 is hydrogen, alkyl or phenyl;

R_3 and R_4 together may form an alkylene chain completing a five or six membered alicyclic ketone or dione;

R_5 is:

A. naphthyl, phenyl or, indanyl; or

B. phenyl substituted with one or more chloro, fluoro, bromo, nitro, alkyl, alkynyloxy, alkoxy, dialkylamino, alkylthio, alkylthioalkyl, alkylsulfinylalkyl, alkylsulfonylalkyl, or dialkylaminomethyleneimino groups; or

C.  , wherein:

R_6 and R_7 are individually hydrogen, chloro, alkyl, phenyl, alkylthio, alkylthioalkyl, alkylsulfinylalkyl, alkylsulfonylalkyl, nitroalkyl or alkanoyl group;

wherein R_1, R_2, R_3, R_4, R_6 and R_7 substituents individually may not include more than six aliphatic carbon atoms.

4,081,551
OXIME ETHERS HAVING ANTI-DEPRESSIVE ACTIVITY

Hendricus Bernardus Antonius Welle, Utrecht, and Volkert Claassen, Weesp, both of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

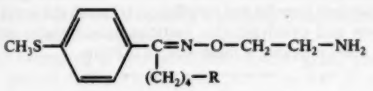
Filed Mar. 19, 1976, Ser. No. 668,490

Claims priority, application Netherlands, Mar. 20, 1975, 7503309

Int. Cl.[2] **A61K** *31/15, 31/275;* **C07C** *121/78, 131/00*

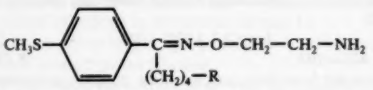
U.S. Cl. 424—304 **10 Claims**

1. Oxime ether compounds of the formula



and salts thereof with pharmaceutically acceptable acids, in which formula R is methoxy, ethoxy, methoxyethoxy, methoxymethyl, cyano cyanomethyl or chlorine.

9. A method of treating depressed patients, administering to said patients an antidepressively effective quantity of a compound of the formula



wherein R is ethoxy, methoxy, methoxyethoxy, methoxymethyl, cyano, cyanomethyl or chlorine or a salt thereof with a pharmaceutically acceptable acid

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4,081,552
OXIME ETHERS HAVING ANTI-DEPRESSIVE ACTIVITY

Hendricus Bernardus Antonius Welle, Utrecht, and Volkert Claassen, Weesp, both of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 19, 1976, Ser. No. 668,454

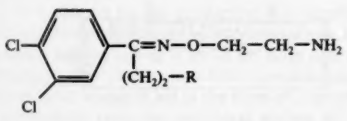
Claims priority, application Netherlands, Mar. 20, 1975, 7503311

Int. Cl.[2] **A61K** *31/15, 31/275;* **C07C** *121/78, 131/00*

U.S. Cl. 424—304 **13 Claims**

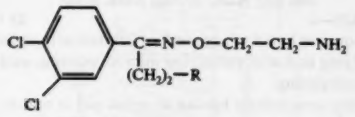
1. Compounds as represented by formula

(I)



and salts thereof with pharmaceutically acceptable acids, in which formula R is the group $(CH_2)_pCN$, the group $(CH_2)_pO(CH_2)_qCH_3$ or the group $(CH_2)_rO(CH_2)_2OCH_3$, wherein $p = 1, 2$ or 3, q is 1 if $p = 1$ and q is 0 if $p = 2$ or 3 and $r = 0$, 1 or 2.

12. An antidepressive composition comprising an antidepressively effective compound of the formula



wherein R is $(CH_2)_pCN$ where p is 1, 2 or 3 or a salt thereof formed with a pharmaceutically acceptable acid and a pharmaceutically acceptable carrier thereof.

4,081,553
CYTOPROTECTIVE PROSTAGLANDINS FOR USE IN HUMAN INTESTINAL DISEASES

André Robert, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Feb. 17, 1976, Ser. No. 658,148

Int. Cl.[2] **A61K** *31/215, 31/19*

U.S. Cl. 424—305 **4 Claims**

1. A method of treatment of Crohn's disease, inflammatory bowel disease, sprue, or intestinal inflammatory disease secondary to an intestinally manifested allergic response to foodstuffs, which comprises:

administering to a human who suffers from said disease an amount of cytoprotective prostaglandin effective to cure said disease.

4,081,554
1-OXO-2,2-DISUBSTITUTED-5-INDANYLOXY(OR THIO)ALKANO ACIDS

Edward J. Cragoe, Jr., Lansdale, and Otto W. Woltersdorf, Jr., Chalfont, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

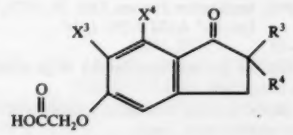
Division of Ser. No. 399,571, Sep. 21, 1973, Pat. No. 3,984,465. This application Jul. 13, 1976, Ser. No. 704,853

Claims priority, application Canada, Oct. 13, 1972, 153821; Aug. 28, 1973, 178824

Int. Cl.[2] **A61K** *31/19;* **C07C** *69/76;* **A61K** *31/235, 31/165*

U.S. Cl. 424—317 **13 Claims**

11. A method of treatment of edema, hyperuricemia and hypertension which comprises administering a unitary dosage of from 10 mg. to 500 mg. of a compound of the formula:



R^3 and R^4 are joined together with the carbon atoms to which they are attached to form cycloalkyl containing from 5 to 6 nuclear carbon atoms;

X^3 and X^4 are the same or different radicals selected from methyl or chloro and the non-toxic pharmacologically acceptable salt derivatives thereof

in a total daily dose of from 10 mg. to 2000 mg.

4,081,555

PRESERVATION OF WHEY

James W. Sawhill, Canoga Park, Calif., assignor to Roger Marten, Mondovi, Wis., a part interest

Filed Jun. 9, 1976, Ser. No. 694,460
Int. Cl.[2] A23C *21/00*; A23K *3/00*
U.S. Cl. 426—2 15 Claims

1. An aqueous liquid whey product substantially resistant to the putrefying action of putrefying microorganisms, said whey product comprising:

(a) a whey concentrate having an initial pH in excess of 4.2, said whey concentrate comprising 10 to 65% by weight of whey solids distributed through an aqueous phase, a portion of said whey solids including lactic acid;

(b) 0.01 to 5% by weight, based on the weight of total solids in said whey product, of a preservative agent comprising at least one substantially non-toxic carboxylic acid or substantially non-toxic salt thereof, said carboxylic acid being selected from the group consisting of solid, unsaturated aliphatic carboxylic acid and aromatic carboxylic acid;

(c) in combination with said preservative agent, an amount of acid added to said aqueous phase of said concentrate to downwardly adjust the said initial pH to the pH range of 2.5 to 4.2, said acid being different from the preservative agent and said amount of said acid being in addition to the lactic acid included in said whey solids; said combination imparting to said aqueous liquid whey product a substantial resistance to the putrefying action of putrefying microorganisms at various temperatures including 5°, 23°, and 37° C.

4,081,556

PRODUCT FOR FEEDING BEES

Jean-Louis Louveaux, Bures sur Yvette; Danielle LeJolly nee Vereecque, Massat, and Michel Huchette, Lestrem, all of France, assignors to Institut National de la Recherche Agronomique, Paris, France

Filed Jun. 4, 1976, Ser. No. 692,920
Claims priority, application France, Jun. 6, 1975, 75 17797; Feb. 25, 1976, 76 05271
Int. Cl.[2] A23K *1/00*
U.S. Cl. 426—2 13 Claims

1. A method for feeding bees which comprises feeding bees a composition comprising a syrup of maltose which is the product of enzymatic hydrolysis of starch, the maltose content of which is at least 40% by weight whereby the product does not crystallize and is free from toxic subtances.

4,081,557

PROTEIN ENRICHMENT OF MAIZE, CASSAVA AND OTHER STARCHY PRODUCTS BY DIRECT FERMENTATION

Edgard Elie Yves Azoulay, Marseilles, France, assignor to Adour Entreprise, Pau, France

Filed Oct. 12, 1976, Ser. No. 731,554
Claims priority, application France, Oct. 20, 1975, 75 32010
Int. Cl.[2] A23J *1/00, 1/14*
U.S. Cl. 426—18 4 Claims

1. Process for the protein enrichment of products rich in starch, which comprises

a. grinding maize or cassava to form a powder the grains of which are smaller than 1 mm,

b. bringing the powder into suspension,

c. adding inorganic salts, a source of nitrogen, oligo-elements and growth factors to the suspension so as to constitute a complete nutrient medium,

d. subjecting the nutrient medium to a direct and continuous fermentation with Candida Tropicalis yeast without a prior chemical or enzymatic hydrolysis of said maize or cassava, the said fermentation being carried out with vigorous stirring and vigorous aeration at a pH of between 4 and 6 and at a temperature of between 30° and 39° C, and

e. recovering the resulting biomass by centrifuging and dessicating it to give a directly consumable flour rich in proteins.

4,081,558

PROCESSES AND APPARATUS FOR PRODUCING ACTIVE DRIED YEAST

Frederick S. M. Grylls, Morden, England; Stanley D. Rennie, Menstrie, and Michael Kelly, Stirling, both of Scotland, assignors to The Distillers Company (Yeast) Limited, Morden, England

Filed Aug. 20, 1976, Ser. No. 716,055
Claims priority, application United Kingdom, Aug. 22, 1975, 34862/75
Int. Cl.[2] C12C *11/30*
U.S. Cl. 426—62 11 Claims

1. A method of making powdered active dried yeast comprising drying crumbly yeast aggregates in a fluidized bed, and, during the fluidized bed drying, and before the yeast has a dry matter content of 80%, subjecting the aggregates to disintegration forces while they are fluidized, the disintegration forces being applied continuously or intermittently throughout the time the dry matter content of the yeast is from 50 to 70% and said distintegration forces being sufficient to break the aggregates down into powder but insufficient to break the yeast cells themselves said dried powder particles substantially all pass through a sieve having a mesh size of 0.35mm.

4,081,559

EDIBLE COMPOSITION AND METHOD OF MANUFACTURING SAME

Maurice Stanley Jeffery, Solihull; Paul Anthony Glynn, Rubery, and Mohammed Moiz Uddin Khan, Solihull, all of England, assignors to Cadbury Limited, Bourniville, England

Division of Ser. No. 705,207, Jul. 14, 1976, Pat. No. 4,045,583.
This application Oct. 20, 1976, Ser. No. 734,210
Claims priority, application United Kingdom, Jul. 22, 1975, 30570/75
Int. Cl.[2] A23G *1/00*
U.S. Cl. 426—103 8 Claims

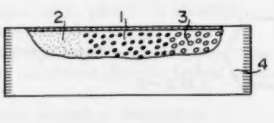
1. A shaped heat-resistant chocolate product containing 15 to 35% by weight of at least one edible fat selected from (a) cocoa butter and (b) cocoa butter and at least one other fat, not less than 40% by weight sugar, and not more than 5% by weight of water, wherein said at least one edible fat is present as individual particles which are separated from one another in a sugar glass so that a discontinuous fat phase is present in the chocolate product.

4,081,560

INSTANT MILK-CONTAINING COFFEE

Takayoshi Ishigaki, Tokyo, Japan, assignor to Ishigaki Shokuhin, Inc., Tokyo, Japan

Filed Oct. 18, 1976, Ser. No. 733,189
Claims priority, application Japan, Nov. 18, 1975, 50-156455[U]; Dec. 17, 1975, 50-170275[U]
Int. Cl.[2] B65D *81/32*
U.S. Cl. 426—115 2 Claims



1. A package containing dried coffee particles, cream powder and sugar components located in a moisture-proof bag of an elongated configuration, said dried coffee particles, cream

powder and sugar components being inherently free-flowing, but positioned in the bag so that they are immobilized and separate and distinct from each other, except that the borderline surface of at least one of said coffee, cream and sugar components is in direct contact with the borderline of at least one of the other components in a direction substantially perpendicular with the elongated direction of the bag and wherein the components are immobilized by being sealed and tightly contained in the bag by vacuum so that they do not move from their original positions and mix with each other, but are capable of freely flowing out of the bag when the bag is opened and the vacuum broken.

4,081,561

PARTIALLY DECAFFEINATED SOLUBLE COFFEE PRODUCT AND METHOD THEREFOR

Franklyn Wallace Meyer, Bedford; Esra Pitchon, Flushing, and Ernest Lord Earle, Jr., New City, all of N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Filed Apr. 13, 1976, Ser. No. 676,458
Int. Cl.[2] A23C *1/06*
U.S. Cl. 426—385 **2 Claims**

1. A method for producing a partially decaffeinated soluble coffee product comprising the steps of:

(a) extracting a non-decaffeinated, low-grade roasted and ground coffee fraction with 180° F. to 300° F. water to a roasted yield greater than about 12% by weight, the resulting water extract containing below about 10% soluble solids by weight and at least 75% of the caffeine contained in said low-grade coffee fraction,

(b) thereafter extracting this low-grade coffee fraction with an aqueous extraction medium to an additional roasted yield of at least 20% by weight, and

(c) stripping volatiles from the extract of step a) and condensing and combining these volatiles with the soluble solids contained in the extract of step b),

(d) water extracting a high-grade non-decaffeinated roasted and ground coffee fraction,

(e) combining the extract of step d) with the extract of step b) and then,

(f) drying the resulting mixture.

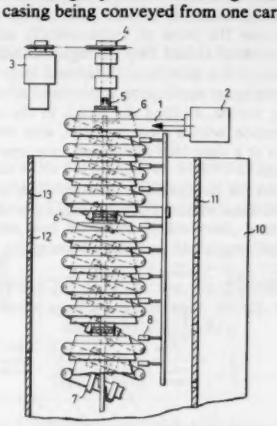
4,081,562

PROCESS FOR THE PRODUCTION OF EDIBLE WREATH-SHAPED FOOD CASINGS

Bruno Winkler, Weinheim, Oberflockenbach, Germany, assignor to Naturin-Werk Becker & Co., Badenia-Strasse, Germany

Continuation of Ser. No. 452,333, Mar. 18, 1974, abandoned. This application Jan. 9, 1976, Ser. No. 647,977
Claims priority, application Germany, Mar. 24, 1973, 2314767
Int. Cl.[2] A22C *13/00*
U.S. Cl. 426—390 **4 Claims**

1. In a process for the production of a wreath-shaped food casing by blow extrusion from an extrusion nozzle, wherein the extruded inflated casing is led in the form of a spiral, the improvement of producing an edible wreath-shaped food casing wherein said casing in led in the form of a spiral by extruding it tangentially onto the peripheral surface of the first of a succession of truncated conical carrier elements, mounted one after another on a common axis, said carrier elements being simultaneously rotated with a peripheral speed substantially equal to the discharge speed of the casing from the extrusion nozzle, the casing being conveyed from one carrier element of



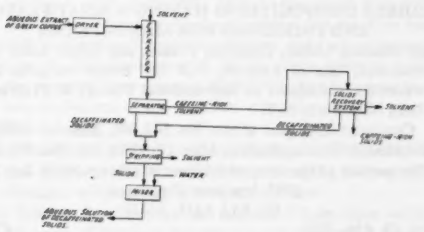
the succession to the next with the aid of guide means arranged obliquely to the axis of rotation of said elements.

4,081,563

DECAFFEINATION OF GREEN COFFEE

Stephen F. Hudak, Ossining, N.Y., and James P. Mahlmann, Wayne, N.J., assignors to General Foods Corporation, White Plains, N.Y.

Filed Jan. 28, 1976, Ser. No. 652,950
Int. Cl.[2] A23L *1/28*
U.S. Cl. 426—428 **8 Claims**



1. A method for decaffeinating green coffee wherein an aqueous extraction fluid contacts and extracts caffeine from caffeine-containing green coffee resulting in an aqueous solution of green coffee solubles and wherein caffeine is removed from caffeine containing green coffee solubles by means of a liquid organic solvent for caffeine to form non-caffeine green coffee solubles, the improvement comprising drying the aqueous solution of green coffee solubles and extracting the dried solids with an organic water-miscible caffeine solvent.

4,081,564

METHOD AND APPARATUS FOR CONTINUOUSLY MAKING LOAF MEAT

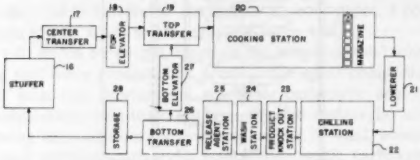
Alvin Borsuk, Madison, Wis., assignor to Oscar Mayer & Co. Inc., Madison, Wis.

Filed Mar. 11, 1975, Ser. No. 557,400
Int. Cl.[2] A22C *7/00*; A23L *1/01*
U.S. Cl. 426—513 **18 Claims**

1. A method of continuously making a loaf meat product from a stuffable meat material, wherein a plurality of magazines of molds are sequentially moved in order through release agent application, stuffing, cooking, chilling, knockout and wash stations, and where the release agent application, cook-

ing, chilling, knockout and wash stations are in a closed loop and said stuffing station is outside said closed loop, which method comprises the steps of: incrementally advancing the magazines around the closed loop through the stations, removing magazines one at a time from the closed loop downstream from the release agent application station and advancing same to the stuffing station, stuffing the molds in the magazines at the stuffing station with a meat material, and reinserting the magazines one at a time into the closed loop upstream of the cooking station.

14. Apparatus for continuously making a loaf meat product from a stuffable meat material comprising, a plurality of maga-



zines each of which includes a plurality of loaf molds, means for stuffing the molds with a meat material at a stuffing station, means for incrementally advancing the magazines around a closed loop having in order means for cooking the meat material in the molds to define a loaf meat product, means for chilling the product in the molds, means for removing the product from the molds, means for washing the molds, and means for applying a release agent to the molds, and means for removing magazines of molds one at a time from the closed loop immediately upstream of the stuffing station whereby said magazines are transferred to said stuffing station, and means for returning the magazines of molds one at a time back into the closed loop upstream of the means for cooking.

4,081,565

EDIBLE COMPOSITIONS HAVING A MEAT FLAVOR AND PROCESSES FOR MAKING SAME

Lim Chheang Chhuy, Bougival, France, and Edgar Allen Day, deceased, late of Rumson, N.J. (by Esther Virginia Day, executrix), assignors to International Flavors & Fragrances Inc., New York, N.Y.

Continuation-in-part of Ser. No. 342,360, Mar. 19, 1973, abandoned. This application Mar. 15, 1974, Ser. No. 451,469

The portion of the term of this patent subsequent to Jul. 23, 1985, has been disclaimed.

Int. Cl.[2] A23L *1/227*

U.S. Cl. 426—533 **1 Claim**

1. A process for altering the meat flavor of a foodstuff comprising adding to said foodstuff at least 0.2% by weight of a flavor imparting product produced by a process comprising (A) intimately admixing in the absence of any natural meat or poultry meat products other than an enzymatic digest of meat, a composition consisting essentially of (i) an enzymatic digest of meat produced by admixing from 0.1 up to 0.4% enzyme with meat at a pH of from 3 up to 6, at a temperature of from 40° up to 75° C for a period of from 10 hrs. up to 150 hrs., selected from the group consisting of mylase digest of turkey meat; mylase digest of chicken meat; mylase digest of beef; mylase digest of lamb meat and mylase digest of pork, (ii) L-cysteine hydrochloride and (iii) thiamine hydrochloride; said enzymatic digest of meat, said L-cysteine hydrochloride and said thiamine hydrochloride each being present in an amount sufficient to produce an intense meat flavor, the weight percent of cysteine based on enzymatic meat digest being from 2 up to 5%, the ratio of thiamine hydrochloride; cysteine hydrochloride being in the range of from 0.25:1 up to 1:1 (B) heating the resulting mixture at a temperature of from 100° up to 350° C, a pressure of from 1–10 atmospheres and for a period of time of from 0.2 up to 10 hrs. whereby a meat flavored product is produced; and (C) adding gum arabic to the meat flavor and spray drying the resulting mixture, the weight ratio of gum arabic to said meat flavor being from 0.2:1 up to 2:1 based on the solids content of the mixture prior to spray drying.

4,081,566

DRY DESSERT MIX COMPOSITION

George J. Haber, New York, N.Y., assignor to International Flavors & Fragrances Inc., New York, N.Y.

Filed Sep. 15, 1976, Ser. No. 723,584

The portion of the term of this patent subsequent to Mar. 28, 1995, has been disclaimed.

Int. Cl.[2] A23L *1/14;* A23C *23/00*

U.S. Cl. 426—578 **10 Claims**

1. A process for preparing a dessert which consists of intimately admixing (i) a dry composition consisting of a pregelatinized starch, an edible acid present in an amount sufficient to bring the pH of a subsequently milk-reconstituted mix to 3–5, and a hydrocolloid gum consisting of a mixture of guar gum and xanthan gum, and (ii) fluid milk.

4,081,567

DRY BEVERAGE MIX COMPOSITION

George J. Haber, New York, N.Y., assignor to International Flavors & Fragrances Inc., New York, N.Y.

Filed Nov. 11, 1976, Ser. No. 740,889

The portion of the term of this patent subsequent to Mar. 28, 1995, has been disclaimed.

Int. Cl.[2] A23C *23/00;* A23L *1/14*

U.S. Cl. 426—580 **5 Claims**

1. A process for preparing a beverage which consists of intimately admixing (i) a dry composition consisting of a pregelatinized starch, an edible acid present in an amount sufficient to bring the pH of a subsequently milk-reconstituted mix to 3–5, and a hydrocolloid gum consisting of a mixture of guar gum and xanthan gum, and (ii) fluid milk, the ratio of said dry composition to said milk being about 3½ ounces of composition:2 cups of milk, whereby a fluid liquid-phase beverage is produced.

4,081,568

MILK CHOCOLATE MANUFACTURING

Umberto Bracco, La Tour-de-Peilz, Switzerland, assignor to Societe d'Assistance Technique pour Produits Nestle S.A., Lausanne, Switzerland

Filed Mar. 4, 1976, Ser. No. 663,716

Claims priority, application Switzerland, Mar. 5, 1975, 2752/75

Int. Cl.[2] A23G *1/00;* A23C *9/00*

U.S. Cl. 426—584 **12 Claims**

1. A method of making a milk powder product for use as an ingredient in the making of milk chocolate which comprises preparing a mixture of milk and sugar, adjusting the pH-value of the mixture to a value of from 6.25 to 6.7, and then drying the mixture to provide said product.

4,081,569

COFFEE BLEND COMPRISING GROUND-ROASTED AND ROASTED-GROUND COFFEE BEANS

Richard Gregg, Greenhills, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Feb. 28, 1973, Ser. No. 336,647

Int. Cl.[2] A23F *1/02*

U.S. Cl. 426—595 **3 Claims**

1. A method of manufacturing a blended ground coffee comprising mixing from about 90 to about 30 wt. % of a conventional roasted and ground first coffee component with from about 10 to about 70 wt. % of a ground-roasted second coffee component comprising at least 20% by weight Robustas; wherein said second coffee component is obtained by

(a) comminuting green coffee beans, and

(b) roasting the comminuted green beans of step (a).

4,081,570
PROCESS FOR PRODUCING A CONFECTION FROM SEED VESSELS

Friedrich Otto, Hameln (Weser), Germany, assignor to A. Stephan U. Sohne GmbH & Co., Hameln, Weser, Germany

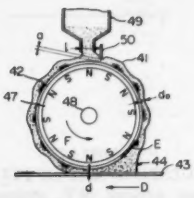
Filed Nov. 12, 1976, Ser. No. 741,458
Claims priority, application Germany, Nov. 20, 1975, 2552045
Int. Cl.[2] A23G *3/00*
U.S. Cl. 426—629 10 Claims

1. A process for producing a confection from seed vessels, comprising the steps of:
(a) forming a mixture of sugar and comminuted seed vessels:
(b) introducing heated gases directly to said mixture so as to heat said mixture to at most 120° C;
(c) kneading said mixture so that a mixed mass is formed; and
(d) cooling the mixed mass to at most 50° C.

4,081,571
METHOD FOR DEVELOPING ELECTROSTATIC LATENT IMAGES

Hitoshi Nishihama, Hirakata; Katsuhiko Gotoda, Osaka; Minoru Motomura, Nara; Takanobu Nakajima, Kashihara, and Tatsuo Aizawa, Osaka, all of Japan, assignors to Mita Industrial Co. Ltd., Osaka, Japan

Filed Jul. 29, 1975, Ser. No. 599,953
Claims priority, application Japan, Aug. 1, 1974, 49-88381
Int. Cl.[2] G03G *13/08, 13/09*
U.S. Cl. 427—18 21 Claims



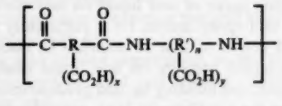
1. A method for developing an electrostatic latent image formed on the surface of an image-bearing material by applying a powdery developer thereto, which comprises bringing the surface of a developer-retaining member retaining a layer of the powdery developer on its surface into rolling contact with the surface of said image-bearing material through the developer in such a relation that a reservoir zone of the developer is formed upstream of and adjacent to the rolling contact zone of both surfaces, and physically disturbing the developer in said reservoir zone to cause the developer to make an irregular motion.

4,081,572
PREPARATION OF HYDROPHILIC LITHOGRAPHIC PRINTING MASTERS

Thomas J. Pacansky, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Feb. 16, 1977, Ser. No. 769,078
Int. Cl.[2] B41C *1/10*
U.S. Cl. 427—53 9 Claims

1. A method for preparing a printing master comprising:
(a) providing a self-supporting master substrate,
(b) providing a hydrophilic polymer of the formula:

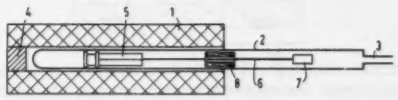


wherein R' is a carbonyl group or R and R' are the same or different hydrocarbon moieties which may be acyclic, aliphatic cyclic or bicyclic or aromatic, *n* is an integer of 0 or 1, *x* and *y* are integers of from 0 to 2 providing that when *n* is 0, *y* is 0, and when R' is a carbonyl group, *y* is 0,
(c) coating said substrate with said polymer, and
(d) selectively thermally converting said polymer to a hydrophobic condition in image configuration.

4,081,573
METHOD FOR PREPARING SUPERCONDUCTIVE NB_3SN LAYERS ON NIOBIUM SURFACES FOR HIGH-FREQUENCY APPLICATIONS

Hans Martens, and Bernhard Hillenbrand, both of Erlangen, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Jul. 15, 1976, Ser. No. 705,418
Claims priority, application Germany, Jul. 21, 1975, 2532570
Int. Cl.[2] C23C *13/02*
U.S. Cl. 427—62 11 Claims



1. A method for the preparation of superconductive Nb_3Sn layers on niobium surfaces for high frequency applications comprising:
(a) forming a reaction zone in an evacuated reaction chamber which zone is set apart from the rest of the volume of the chamber;
(b) disposing a quantity of essentially pure tin and the niobium surface to be provided with the Nb_3Sn layer in the zone;
(c) sealing the zone off from the rest of the chamber volume, leaving a small connecting path, to the extent that while any gases present or produced within the reaction zone will be drawn off from the reaction zone when the reaction chamber is evacuated, the tin vapor pressure within the reaction zone remains higher than the tin vapor pressure in the rest of the chamber when the reaction zone is then heated;
(d) heating the reaction zone to a temperature between 930° and 1400° C while continuously pumping the reaction chamber with a pump to evacuate it; and
(e) holding that temperature until an Nb_3Sn layer with a thickness of between 0.5 and 5 μm is formed on the niobium surface.

4,081,574
MULTICHAMBER VAPOR DEPOSITION PROCESS

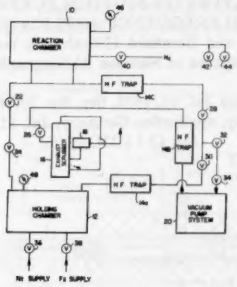
Albert W. Hawkins, Princeton, N.J.; Matthew J. O'Hara, Monroe, N.Y.; Frank P. Gortsema, Croton, N.Y., and Eddie Hedaya, White Plains, N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 565,944, Apr. 7, 1975, Pat. No. 3,998,180.
This application Sep. 13, 1976, Ser. No. 723,030
Int. Cl.[2] B05D *7/22;* C23C *13/08*
U.S. Cl. 427—237 9 Claims

1. A process for altering the surface characteristic of articles by exposing them to a gaseous fluid of an essentially predetermined composition wherein said fluid is comprised of one or more components which are reactive with the surface of said articles, said process comprising the steps of:
a. admitting said fluid comprised of a known concentration of said one or more components to an apparatus comprised of at least one sealed reaction chamber and at least one sealed holding chamber, each of said chambers having sealable access means for the optional introduction of at least one of said articles, whereby said holding chamber

may optionally be utilized as only a holding chamber for said fluid or additionally as a second reaction chamber;

b. establishing a conduit system communicating said chambers and utilizing vacuum means therewith for selectively creating pressure differentials between said chambers whereby said fluid is transferred between said chambers and each chamber is alternately evacuated or charged with said gaseous fluid;



c. synchronizing a feed and discharge of said articles with respect to said evacuating and charging in said chambers whereby to effect said altering of surface characteristics; and

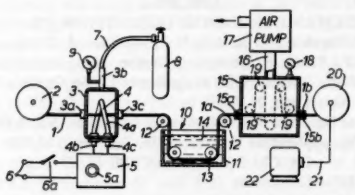
d. in conjunction with said fluid transfer, separating out reaction by-products and contaminants.

4,081,575

METHOD OF FLUX COATING METAL WICK

Ernst Spirig, Movenstrasse 37, Rapperswil, Switzerland

Filed Apr. 30, 1976, Ser. No. 681,843
Int. Cl.² B23K *1/00*
U.S. Cl. 427—327 **3 Claims**



1. The method of manufacturing a flux-coated wick of metal strands, which comprises the steps of:

(a) deoxidizing the metal strand wick;

(b) immediately coating the deoxidized wick with a solution of a fluxing material in a solvent; and

(c) drying the solution of fluxing material and solvent under a vacuum substantially below atmospheric pressure and without raising the temperature of said wick or said solution.

4,081,576

PROCESS FOR PRODUCING AN ADHERENT METAL OXIDE COATING ON A SOLID BODY

Jörg Hensel, Hanau; Edgar Koberstein, Alzenau, and Eduard Lakatos, Rheinfelden, all of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt, Germany

Filed Jul. 7, 1976, Ser. No. 703,165
Claims priority, application Germany, Jul. 16, 1975, 2531769
Int. Cl.² B05D *3/02, 1/18*
U.S. Cl. 427—385 C **8 Claims**

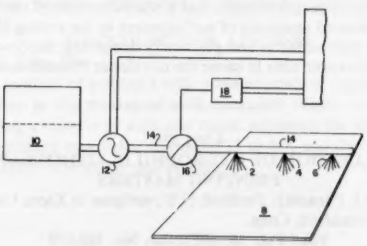
1. In an improved process for producing an adherent coating of a metal oxide selected from the group consisting of Al_2O_3 or TiO_2 on a solid, chemically inert, porous, ceramic carrier for a catalyst by dispersing in water said metal oxide in pulverized form, dipping said carrier into the resulting dispersion, and drying said carrier, wherein the improvement comprises incorporating in said dispersion about 0.001 to about 5% by weight of a nitrogen-containing polymer selected from the group consisting of a polyethylene imine or an ammonium salt of a carboxylic acid polymer, and maintaining a pH of about 7 in said dispersion, wherein said metal oxide is comprised of particles having a grain diameter greater than 1 μm.

4,081,577

PULSED SPRAY OF FLUIDS

Ellwood J. Horner, Armonk, N.Y., assignor to American Hoechst Corporation, Bridgewater, N.J.

Division of Ser. No. 427,673, Dec. 26, 1973, Pat. No. 3,937,175.
This application Jul. 21, 1975, Ser. No. 597,746
Int. Cl.² B05D *1/02*
U.S. Cl. 427—424 **13 Claims**



1. A method for automatically spraying a liquid on the surface of a moving object comprising continuously supplying said liquid to a distribution line at a predetermined pressure and, simultaneously with supplying said liquid to said line, transporting said object past a spray means, pulsatingly applying an impinging spray of said liquid on said surface, as said object passes said spray means, for a sufficiently short, first, predetermined period of time to maintain an essentially constant, predetermined pressure on said liquid issuing through said spray means, and building up said predetermined pressure between pulses for a sufficiently long, second, predetermined period of time to pulsatingly pass said liquid through said spray means at a rate sufficient to deposit a continuous coating of said liquid on said surface of said moving object.

4,081,578

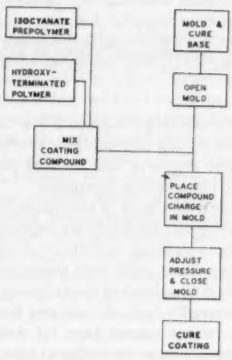
IN-MOLD COATING COMPOSITION AND METHOD OF APPLYING SAME

Willem J. van Essen, Tallmadge; Henry Shanoski, Akron, and Richard M. Griffith, Silver Lake, all of Ohio, assignors to The General Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 483,490, Jun. 27, 1974, abandoned, which is a continuation of Ser. No. 394,029, Sep. 4, 1973, abandoned. This application Oct. 8, 1975, Ser. No. 620,515

Int. Cl.[2] B29C *5/00;* B29D *9/00*

U.S. Cl. 428—63 21 Claims



1. A method of providing a compression or injection molded completely cured reinforced thermoset article with a coating to eliminate surface defects, (1) the composition of said thermoset article comprising a completely cured unsaturated polyester-crosslinkable monomer compound reinforced with glass fibers and containing a low shrink additive and a filler (2) said article having integrally molded an outer surface, at least one boss and/or at least one rib, said boss and/or said rib being opposite to said surface, and (3) said surface having defects comprising sink marks, pores, microcracks, open knit lines and waviness, comprising:

a. placing on said outer surface of said article in a mold a charge of a curable thermosetting coating composition, said charge being sufficient to provide on said surface a coating having a thickness of less than about twenty mils;

b. closing the mold and applying sufficient pressure to said charge to cause the coating composition to substantially uniformly cover and penetrate said surface, the coating composition including a mold release agent and

(i) an isocyanate-terminated material containing unreacted isocyanate groups, and

(ii) a composition containing reactive hydrogen atoms for reaction with (i);

c. curing said coating composition in said mold under heat and pressure to bond said coating composition to said surface; and

d. removing said coated article from said mold, providing said article with a substantially smooth defect-free cross-linked-isocyanate based coating bonded to said surface of said article.

4,081,579

PILE COMPOSITE FABRIC WITH FOAMED ADHESIVE

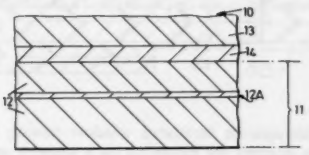
David Stewart Queen, Sanquhar; Peter William Bell, Beith; Thomas Hutcheson Dick, Dundee, and John Black Edgar, Giffnock, all of Great Britain, assignors to Sidlaw Industries Limited, London, England

Division of Ser. No. 439,931, Feb. 5, 1974, Pat. No. 3,953,269. This application Nov. 14, 1975, Ser. No. 631,916

Claims priority, application United Kingdom, Feb. 19, 1973, 6997/73

Int. Cl.[2] B32B *3/02*

U.S. Cl. 428—95 5 Claims



2. A composite fabric in the form of a carpet tile comprising:

a substrate material formed of deaerated thermo-plastics material having a density in the range 4–10 lbs/sq. yard and fibrous material, the thermo-plastics material forming an exposed surface of the carpet tile, the fibrous material forming a layer embedded in said deaerated thermo-plastics material remote from said exposed surface,

a lightweight layer of porous pile-forming material having a density in the range 6–8 oz/sq. yard bonded to the substrate material at the surface thereof remote from said exposed surface, and

a bonding agent in the form of a layer of a foamed plastics material in a gelled state securing said layer of porous pile-forming material to said substrate material without substantial penetration of said pile-forming material.

4,081,580

PAPER WRAPPER FOR WRAPPING REFRIGERATED MEAT

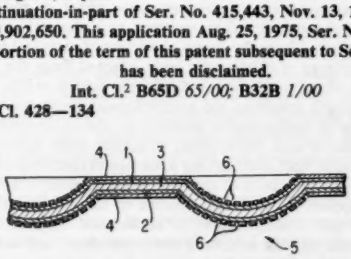
Eiji Kato, No. 2-11, Higashiteraokitadai, Tsurumi, Yokohama, Kanagawa, Japan

Continuation-in-part of Ser. No. 415,443, Nov. 13, 1973, Pat. No. 3,902,650. This application Aug. 25, 1975, Ser. No. 607,709

The portion of the term of this patent subsequent to Sep. 2, 1992, has been disclaimed.

Int. Cl.[2] B65D *65/00;* B32B *1/00*

U.S. Cl. 428—134 3 Claims



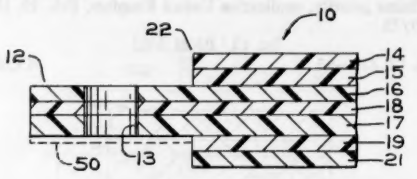
1. A paper wrapper for wrapping refrigerated meat comprising single or multi-ply paper board having a thickness of 20/100–80/100 mm, and coated on both sides for imparting water-proofing properties, embossed with rugose patterns having a side length of 1–8 mm, with a depth of 40–130 % of the thickness of the paper at intervals of 0.5–8 mm, and at a density of 2–11/cm^2, having after embossing, a water resistance 30–350 g/m^2 at the rugose surface, an air permeability of 50–200 seconds/100 cc and a bursting strength of 3.5–14 kg/cm^2, and having fine cracking in the water-resistant coating at the rugose surface.

4,081,581

LAMINATED AIRCRAFT WINDSHIELD

Harry E. Littell, Jr., Gibsonia, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 456,925, Apr. 1, 1974, abandoned. This application May 5, 1976, Ser. No. 683,352
Int. Cl.[2] E04C *1/00*; B32B *27/36, 27/40*
U.S. Cl. 428—138 36 Claims



1. A transparent laminated window having high impact resistance adapted for mounting on a support structure, said window comprising an outer protective sheet or ply of an abrasion resistant, chemical resistant and thermal resistant material selected from the group consisting of glass and plastic and a sublaminate comprising a plurality of thin, transparent, structural sheet members of polycarbonate resin each having a maximum thickness of 0.250 inch, elastomeric resinous interlayer material selected from the group consisting of polyurethanes and silicones which exhibit good tensile strength retention and embrittlement resistance over a wide range of temperatures disposed between and bonded to said structural sheet members, said structural sheet members and said elastomeric resinous interlayer material extending beyond the edge of said outer protective sheet to form edge portions integral therewith for mounting of the window to said support structure, said structural sheet members and said interlayer material having aligned spaced apertures in said edge portions and adapted for alignment with spaced apertures on said support structure for said window for receipt of edge attachment means applied only through said apertures when aligned to rigidly secure said edge portions to said support structure for said window such that loads imposed on said window are transferred from said window to said support structure through said structural sheet members and said edge attachment means, and interlayer material selected from said group bonding said outer protective sheet or ply to said sublaminate.

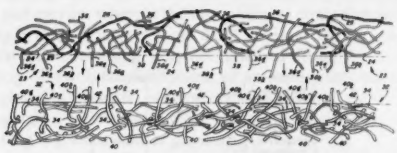
15. A transparent laminated window having high impact resistance adapted for mounting on a support structure, said window comprising an outer protective sheet or ply of an abrasion resistant, chemical resistant and thermal resistant material selected from the group consisting of glass and plastic, a first interlayer of elastomeric resin selected from the group consisting of polyurethanes and silicones which exhibit good tensile strength retention and embrittlement resistance over a wide range of temperatures adhered to said outer protective sheet, a pair of thin, transparent, structural sheet members of polycarbonate resin each having a maximum thickness of 0.250 inch, a second interlayer of elastomeric resin selected from said group disposed between and bonded to said structural sheet members, said first interlayer of elastomeric resin being adhered to one of said structural sheet members, and said first interlayer and said second interlayer of elastomeric resin having a thickness greater than 0.015 inch, whereby the propagation of cracks caused by impact on said outer protective sheet is minimized, said structural sheet members and said second interlayer of elastomeric resin extending continuously beyond the edge of said outer protective sheet to provide aligned edge portions integral therewith for mounting of the window to said support structure, said structural sheet members and said interlayer material having aligned spaced apertures in their edge portions and adapted for alignment with spaced apertures on said support structure for said window for receipt of edge attachment means applied only through said apertures when aligned to rigidly secure said edge portions of said structural sheet members and said interlayers to said support structure for said window such that loads imposed on said structural sheet members are transferred from said structural sheet members to said support structure through said edge attachment means.

4,081,582

FIBROUS MATERIAL AND METHOD OF MAKING THE SAME

George A. M. Butterworth, Western Springs; Robert T. Elias, Downers Grove, and Wayne D. Miller, Oak Lawn, all of Ill., assignors to Johnson & Johnson, New Brunswick, N.J.

Filed Oct. 20, 1976, Ser. No. 734,208
Int. Cl.[2] B32B *5/08*
U.S. Cl. 428—284 40 Claims



1. A method of producing a high loft, low density, nonwoven fibrous material having thermoplastic synthetic wood pulp fibers in at least one region of said material parallel to or including its median plane which comprises:

bringing together a first layer of irregularly arranged, intersecting, overlapping, mechanically interengaged, loosely assembled fibers defining interstices therebetween, said fibers including fibers other than thermoplastic synthetic wood pulp fibers, said layer of fibers having free fiber ends extending outwardly from at least one boundary surface of the layer, with a second layer of similarly disposed fibers, said second layer including at least thermoplastic synthetic wood pulp fibers and optionally, other fibers, said thermoplastic synthetic wood pulp fibers located at least in surface portions of said layer immediately adjacent said one boundary surface of the first layer and having free fiber ends extending outwardly therefrom, to bring at least some of the fiber segments of thermoplastic synthetic wood pulp fibers of said second layer into contact with said first layer of fibers of inserting free fiber ends from at least one of said layers into interstices between fibers in the other of said layers, thermoplastic synthetic wood pulp fibers that are mechanically interengaged with other fibers in the second layer being present at the boundary surface of said layer adjacent said first layer in a quantity sufficient to occupy at least about 10 percent of the area occupied by exposed fiber segments contained in the second layer at its said boundary surface, at least some of the interstices between fibers of said first layer being of a width at least twice as large as the mean diameter of said thermoplastic synthetic wood pulp fibers in said second layer, at least some of the interstices between fibers of said second layer being of a width at least twice as large as the mean diameter of the fibers in said first layer, said thermoplastic synthetic wood pulp fibers in the second layer having a melting point lower than the melting point or degradation temperature of every other type of fibers contained in said two layers; and

applying heat in the absence of pressure at least to the portions of said two fibrous layers in which thermoplastic synthetic wood pulp fibers of said second layer that are in contact with fibers of said first layer are located, to fuse and bond at least some of said contacting thermoplastic synthetic wood pulp fibers to fibers of said first layer and thereby produce a fibrous material of good stability and mechanical integrity, which displays excellent resistance to delamination as well as good hand and softness.

4,081,583

ELECTROSTATIC RECORDING MATERIAL

Toyomi Akiyama, Sakai; Taiji Higaki, Nishinomiya; Eiichiro Shiratsuchi, Tokyo, and Eijiro Tagami, Yokohama, all of Japan, assignors to Japan Synthetic Rubber Co., Ltd. and Kanzaki Paper Manufacturing Co., Ltd., both of, Japan

Continuation-in-part of Ser. No. 86,630, Nov. 3, 1970, abandoned. This application Dec. 17, 1974, Ser. No. 533,703

Claims priority, application Japan, Nov. 15, 1969, 44-91544

Int. Cl.[2] B32B *15/08*

U.S. Cl. 428—457 10 Claims

1. An electrostatic recording material on which an electrostatic latent image can be formed without photoelectric conversion or photo-conductive effect, consisting essentially of a base sheet selected from a group consisting of paper, plastic sheet and metal plate, said base sheet having a dried coating thereon of an electric-charge-retentive layer of dielectric polymeric film prepared from an aqueous dispersion comprising (A) 100 parts by weight of at least one water-insoluble polymer prepared from at least one monomer selected from the group consisting of (1) conjugated diolefinic monomers and (2) ethylenic monomers selected from the group consisting of linear olefins, branched olefins, aromatic vinyl compounds, vinyl cyanide compounds, alkyl acrylates, alkyl methacrylates, vinyl ethers, and vinyl halides, and (B) 1 to 200 parts by weight of at least one water-soluble salt selected from the group consisting of an ammonium salt and organic amine salt of a copolymer selected from the group consisting of (1) copolymers of ethylenic monomers selected from the group consisting of linear olefins, branched olefins, aromatic vinyl compounds, vinyl cyanide compounds, alkyl acrylates, alkyl methacrylates, vinyl halides, acrylamide, methacrylamide, and vinyl ethers and unsaturated monobasic carboxylic acids, (2) copolymers of conjugated diolefinic monomers and unsaturated monobasic carboxylic acids, and (3) copolymers of ethylenic monomers selected from the group consisting of linear olefins, branched olefins, aromatic vinyl compounds, vinyl cyanide compounds, alkyl acrylates, alkyl methacrylates, vinyl halides, acrylamide, methacrylamide, and vinyl ethers, conjugated diolefinic monomers and unsaturated monobasic carboxylic acids, said water soluble salt of the copolymer containing 8 to 50 mole percent of carbox··[1] groups, and said aqueous dispersion being prepared by emulsifying and dispersing the monomer or monomers for constituting the (A) polymer with the (B) water-soluble salt of copolymer containing carboxyl groups in the aqueous medium and then polymerizing the same.

4,081,584

ELECTROSTATIC RECORDING MATERIAL AND METHOD FOR PREPARING THE SAME

Toyomi Akiyama, Sakai; Taiji Higaki, Nishinomiya; Eiichiro Shiratsuchi, Tokyo, and Eijiro Tagami, Yokohama, all of Japan, assignors to Japan Synthetic Rubber Co., Ltd. and Kanzaki Paper Manufacturing Co., Ltd., both of, Japan

Continuation of Ser. No. 86,630, Nov. 3, 1970, abandoned. This application Dec. 17, 1974, Ser. No. 533,494

Claims priority, application Japan, Nov. 15, 1969, 44-91544

Int. Cl.[2] B32B *15/08*

U.S. Cl. 428—514 40 Claims

1. An electrostatic recording material on which an electrostatic latent image can be formed consisting essentially of a base sheet having a dried coating thereon of an electric-charge-retentive layer of dielectric polymeric film prepared from an aqueous dispersion comprising (A) 100 parts by weight of at least one water-insoluble polymer prepared from at least one monomer selected from the group consisting of (1) conjugated diolefinic monomers and (2) ethylenic monomers selected from the group consisting of linear olefines, branched olefines, aromatic vinyl compounds, vinyl cyanide compounds, alkyl acrylates, alkyl methacrylates, vinyl ethers, and vinyl halides, and (B) 1 to 200 parts by weight of at least one water-soluble salt selected from the group consisting of an ammonium salt and organic amine salt of a copolymer selected from the group consisting of (1) copolymers of ethylenic monomers selected from the group consisting of linear olefines, branched olefines, aromatic vinyl compounds, vinyl cyanide compounds, alkyl acrylates, alkyl methacrylates, vinyl halides, acrylamide, methacrylamide, and vinyl ethers and unsaturated monobasic carboxylic acids, (2) copolymers of conjugated diolefinic monomers and unsaturated monobasic carboxylic acids, and (3) copolymers of ethylenic monomers selected from the group consisting of linear olefines, branched olefines, aromatic vinyl compounds, vinyl cyanide compounds, alkyl acrylates, alkyl methacrylates, vinyl halides, acrylamide, methacrylamide, and vinyl ethers and unsaturated monobasic carboxylic acids, said water soluble salt of the copolymer containing 8 to 50 mole percent of carboxyl groups.

4,081,585

FORCED FLOW ELECTROCHEMICAL BATTERY

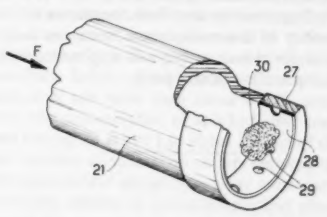
Jean Jacquelin, Limours, France, assignor to Compagnie Generale d'Electricite S.A., Paris Cedex, France

Filed Mar. 21, 1977, Ser. No. 779,876

Claims priority, application France, Mar. 22, 1976, 76.08216

Int. Cl.[2] H01M *8/24*

U.S. Cl. 429—23 21 Claims



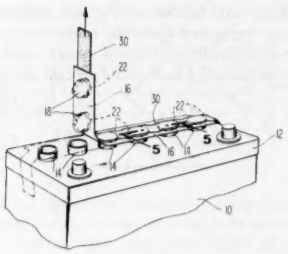
1. In an electrochemical battery comprising a plurality of cells, each cell comprising from the inside towards the outside in particular: a negative collector grid, a porous separator, a porous active catalytic layer, a positive collector grid, and a porous water repellant layer, said battery further comprising means for feeding said cells in series with an electrolytic solution comprising an active material in suspension and in particular zinc powder, said feeding means comprising means for conveying said solution inside said cells, said cells being grouped into *m* modules, each capable of delivering a potential difference U and being connected electrically in series with said modules, means for connecting said modules electrically in series and means for feeding said modules with said solution in parallel, said module feeding means comprising a pump and for each module an input and output pipe for conveying solution from a storage tank towards each of said modules through said input pipe and being returned to said tank after having passed through said module through said output pipe, the improvement comprising *p* designating the rank of a module, said input pipe as well as said output pipe, each comprising at least one electrolytic resistor, said electrolytic resistors being respectively, the input resistor and the output resistor for each module in which said solution flows, and means for connecting said resistors such that said input resistor causes the potential of the solution to vary from the value of the potential in said tank to the value of the potential at the input of said module, and said output resistor causes the value of said potential of the solution to vary from the value of the potential at the output of said module to the value of the potential in said tank.

4,081,586

DISPOSABLE BATTERY PACKAGE FOR CHARGED AND DUMPED BATTERIES

John M. Nees, Wyomissing, Pa., assignor to General Battery Corporation, Reading, Pa.

Filed Apr. 26, 1977, Ser. No. 790,880
Int. Cl.[2] H01M 2/04
U.S. Cl. 429—48 15 Claims



1. A charged and dumped battery package, comprising:
(a) a battery case having a plurality of venting ports therein;
(b) battery sealing strip means disposed over at least the top surface of said ports for at least partially sealing said ports, comprising thin sheet material having a plurality of indentations thereon forming protrusions extending from one side thereof into each of said ports, each of said protrusions having a minute vent hole therein; and
(c) a plurality of disposable insert means, at least one for each port, for at least sealing said strip means with respect to said top surface of said ports.

4,081,587

PROCESS FOR THE MANUFACTURE OF ETHYLENE-ACRYLIC ACID COPOLYMERS

Bert H. Clampitt, and Ronald E. Gilbert, both of Katy, Tex., assignors to Gulf Oil Corporation, Pittsburgh, Pa.

Filed May 16, 1977, Ser. No. 797,649
Int. Cl.[2] C08F 8/14, 8/50
U.S. Cl. 526—54 7 Claims

1. A process for the manufacture of a copolymer containing polymerized ethylene and a polymerized acrylic acid which consists essentially of:
(a) dissolving a copolymer containing polymerized ethylene and a polymerized lower alkyl ester of an acrylic acid in a diarylalkane,
(b) adding a higher alkanol and a transesterification catalyst to the solution of (a),
(c) heating the solution of (b) to reflux temperature to form higher alkyl esters of the acrylic acid and to liberate a lower alkanol by a transesterification reaction and distilling the lower alkanol from the reaction zone,
(d) following the completion of step (c) increasing the solution temperature to remove any remaining higher alkanol from the reaction zone by distillation, and
(e) heating the solution of step (d) to a temperature sufficiently high to thermally decompose the higher alkyl ester of the acrylic acid and form the corresponding acrylic acid,
the copolymer charged in step (a) being a copolymer of ethylene and a methyl or ethyl ester of acrylic or methacrylic acid, the higher alkanol charged in step (b) being isopropanol or tertiary butanol.

4,081,588

VINYL CHLORIDE POLYMERIZATION PROCESS

Dennis Ernest Mackley Evans, Welwyn Garden City, and Edwin Robson, Blackpool, both of England, assignors to Imperial Chemical Industries Limited, United Kingdom

Continuation of Ser. No. 473,674, May 28, 1974, abandoned.
This application Jun. 1, 1976, Ser. No. 691,299
Claims priority, application United Kingdom, Jun. 8, 1973, 27331/73; Jan. 23, 1974, 3118/74
Int. Cl.[2] C08F 2/16, 114/06, 214/06
U.S. Cl. 526—87 6 Claims

1. In a process for the production of a vinyl chloride polymer which comprises polymerizing an aqueous dispersion of vinyl chloride or vinyl chloride and up to 30% by weight thereof at least one other ethylenically unsaturated monomer copolymerizable therewith, wherein before the commencement of polymerization a mixture of monomeric material to be polymerized and water is homogenized in the presence of at least one member of the group consisting of emulsifiers and suspension agents and a monomer soluble polymerization initiator,
the improvement in which the mixture which is homogenized before commencement of polymerization contains 6–75% of the total quantity of monomeric material to be polymerized in the aqueous dispersion, and at least 10% by weight of the water and at least a portion of the initiator to be used in the polymerization reaction and, after homogenization, the homogenized mixture is mixed with the remainder of the monomeric material to be used in the polymerization, which remainder has not been homogenized and has been kept out of contact with the homogenized mixture, to form the aqueous dispersion which is then polymerized.

4,081,589

ELIMINATION OF FIBROUS POLYMERS

Edwin F. Peters, Winfield, and David E. Boone, Lisle, both of Ill., assignors to The Standard Oil Company, Chicago, Ill.

Filed Dec. 20, 1976, Ser. No. 752,519
Int. Cl.[2] C08F 4/64, 10/02, 10/06
U.S. Cl. 526—97 10 Claims

1. In a process for polymerizing alpha-olefins comprising contacting an alpha-olefin or mixtures thereof with a catalyst comprising an effective catalytic amount of a catalyst component prepared from (a) a hydrocarbon-soluble transition metal compound supported on a Group IIA, IIB or VIIB oxide, hydroxide, hydrous oxide, alkoxide or halide and (b) a Group II–III metal organic promoter, the improvement comprising adding to such catalyst an effective amount of a finely divided oxide such that fibrous polymer formation is inhibited.

4,081,590

CATIONIC POLYMERIZATION CATALYST

Joseph P. Kennedy, Akron, Ohio, assignor to Exxon Research & Engineering Co., Linden, N.J.

Division of Ser. No. 221,774, Jan. 28, 1972, Pat. No. 4,029,866.
This application Sep. 2, 1976, Ser. No. 719,850
The portion of the term of this patent subsequent to Jun. 14, 1994, has been disclaimed.
Int. Cl.[2] C08F 4/52, 36/06, 36/08
U.S. Cl. 526—185 9 Claims

1. A cationic catalyst for the homopolymerization of isoolefins and copolymerization of isoolefins and conjugated dienes, said cationic catalyst formed by the reaction comprising:
(a) an organoaluminum having the formula AlR_2X wherein X is a halogen or hydrogen atom and R is the same or a different monovalent radical selected from the group consisting of C_1–C_{12} alkyl, phenyl, C_7–C_{14} aralkyl and C_7–C_{14} alkaryl; and
(b) a cocatalyst selected from the group consisting of sulfur dioxide, sulfur trioxide, mixed halogens, iodine, and

hypohalides, the molar tatio of said AlR_2X to said cocatalyst being greater than 1:1.

4,081,591

METHOD FOR STABILIZING UNSATURATED CYCLOACETAL RESIN

Eiichiro Takiyama, Kamakura; Toshiaki Sugimoto, Yokohama; Goichi Yamaguchi, Urawa, and Susumu Nagao, Takasaki, all of Japan, assignors to Showa Highpolymer Co., Ltd. and Nippon Kayaku Kabushiki Kaisha, both of Tokyo, Japan

Filed Jun. 11, 1976, Ser. No. 694,999

Claims priority, application Japan, Jun. 11, 1975, 50-69598

Int. Cl.² C08F *2/00, 4/00*

U.S. Cl. 526—217 **5 Claims**

1. A method for stabilizing an unsaturated cycloacetal resin produced by reacting (I) a cycloacetal compound selected from the group consisting of diallylidene pentaerythritol, triallylidene sorbitol, dicrotonylidene pentaerthritol and dimethallylidene pentaerythritol with (II) an unsaturated alcohol selected from the group consisting of 2-hydroxyethyl acrylate, 2-unsaturated methacrylate, 2-hydroxypropyl acrylate and 2-hydroxypropyl methacrylate, said components (I) and (II) optionally being further reacted with one or more compounds selected from the group consisting of a polyhydric alcohol, a hydroxy polyether and a hydroxy polyester, in the presence of an acid catalyst, which method comprises adding a stabilizer selected from the group consisting of (a) a combination of a secondary amine and a tertiary amine and (b) a combination of a secondary amine and a quaternary ammonium salt to the reaction system, in an amount of 0.01 to 5 parts by weight per 100 parts by weight of the unsaturated cycloacetal resin, during the reaction of producing the unsaturated cycloacetal resin and/or after completion of the reaction, and maintaining the pH of the unsaturated cycloacetal resin at a value higher than 4, measured on the basis of a 50% methyl alcohol solution of the resin.

4,081,592

PROCESS OF POLYMERIZING ACRYLONITRILE COPOLYMERS EMPLOYING TERPINOLENE OR GAMMA TERPINENE AS A CHAIN MODIFIER

Brandford E. Giddings, Warrensville Heights; Gerald P. Coffey, Lyndhurst; William M. Giffen, Jr., Aurora, and Herbert F. Mazeke, Warrensville Heights, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Feb. 17, 1977, Ser. No. 769,510

Int. Cl.² C08F *2/00, 26/00, 32/00, 320/44*

U.S. Cl. 526—248 **6 Claims**

1. The process comprising polymerizing in an aqueous medium in the presence of a free-radical generating polymerization initiator in the substantial absence of molecular oxygen 100 parts by weight of monomers consisting essentially of

(A) from 1 to 90% by weight of at least one nitrile having the structure

$$CH_2=\underset{\displaystyle R}{\overset{|}{C}}-CN$$

wherein R is hydrogen, a lower alkyl group having from 1 to 4 carbon atoms, or a halogen, and

(B) from 99 to 10% by weight of at least one member selected from the group consisting of

(1) an ester having the structure

$$CH_2=\underset{\displaystyle R_1}{\overset{|}{C}}-COOR_2$$

wherein R_1 is hydrogen, an alkyl group having from 1 to 4 carbon atoms, or a halogen, and R_2 is an alkyl group having from 1 to 6 carbon atoms,

(2) a vinyl ether selected from the group consisting of methyl vinyl ether, ethyl vinyl ether, the propyl vinyl ethers, and the butyl vinyl ethers,

(3) vinyl acetate, and

(4) styrene,

in the presence of at least one member selected from the group consisting of terpinolene and gamma terpinene.

4,081,593

PROCESS FOR PRODUCING PHOSPHAZENE FIRE RETARDANT

Carroll W. Lanier, Baker, and James T. F. Kao, Baton Rouge, both of La., assignors to Ethyl Corporation, Richmond, Va.

Division of Ser. No. 529,760, Dec. 5, 1974, Pat. No. 3,974,242, which is a continuation-in-part of Ser. No. 369,171, Jun. 12, 1973, abandoned. This application Jan. 26, 1976, Ser. No. 652,639

Int. Cl.² C08B *16/00;* **D06M** *13/26, 15/00*

U.S. Cl. 536—57 **2 Claims**

1. Regenerated cellulose filaments and articles having dispersed therein a flame retardant amount of a phosphonitrilate polymer prepared according to the process comprising reacting, in the presence of an amount of an acid acceptor sufficient to complex with at least twice the molar amount of hydrogen halide formed, a phosphonitrilic halide with a hydroxyl compound selected from aliphatic alcohols having from one to about six carbon atoms and aromatic alcohols having from six to about ten carbon atoms according to the steps of

(a) contacting a mixture of said phosphonitrilic halide and said acid acceptor with at least about 85 to about 180 weight percent of the theoretical amount based on said phosphonitrilic halide of said hydroxyl compound at a temperature of not more than about 40° C, whereby a relatively low concentration of said hydroxyl compound is present during the initial ¼ to about 3 hours of the reaction and whereby condensation occurs between intermediate phosphonitrilate alkoxy or aryloxy ester species and phosphonitrilic halides or partially esterified phosphonitrilates with the evolution of an alkyl or aryl halide compound, and

(b) thereafter, maintaining the reaction mixture at a temperature of from about 20° to about 50° C for a period of from about ½ to about 120 hours.

4,081,594

UNSATURATED BICYCLIC LACTONE INTERMEDIATES FOR PREPARING PGC-TYPE COMPOUNDS

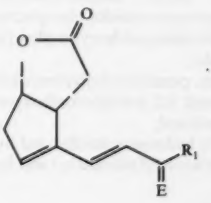
Robert C. Kelly, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 415,050, Nov. 12, 1973, Pat. No. 3,993,686. This application Aug. 2, 1976, Ser. No. 710,622

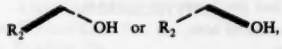
Int. Cl.² C07D *307/77*

U.S. Cl. 542—429 **17 Claims**

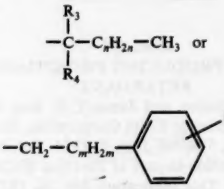
1. An optically active compound of the formula:



or a racemic compound of that formula and the mirror image thereof, wherein E is



in which R_2 is hydrogen or lower alkyl of 1 to 4 carbon atoms, inclusive, and R_1 is



in which R_3 and R_4 are each hydrogen, fluoro or lower-alkyl of 1 to 4 carbon atoms, inclusive, with the proviso that R_3 is fluoro only when R_4 is hydrogen or fluoro; $-C_nH_{2n}-$ is straight chain alkylene of 1 to 5 carbon atoms, inclusive; $-C_mH_{2m}-$ is a valance bond or alkylene of 1 to 9 carbon atoms, inclusive, with 1 to 6 carbon atoms, inclusive, between $-CH_2-$ and the ring; and T is lower-alkyl of 1 to 4 carbon atoms, inclusive, fluoro, chloro, trifluoro-, methyl, or $-OR_2$, in which R_2 is hydrogen or lower-alkyl of 1 to 4 carbon atoms, inclusive, and s is 0 to 3, inclusive, with the proviso that not more than two T's are other than alkyl.

4,081,595

REDUCTION GIVING 3-CEPHEM COMPOUNDS

Wataru Nagata, Nishinomiya; Masayuki Narisada, Ibaraki; Yoshio Hamashima, Kyo, and Kyoto Okada, Osaka, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

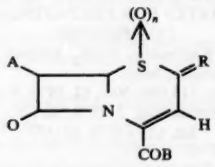
Filed Nov. 11, 1976, Ser. No. 740,967

Claims priority, application Japan, Nov. 11, 1975, 50-135385

Int. Cl.[2] C07D *501/04, 501/60*

U.S. Cl. 544—23 **6 Claims**

1. A process for preparing compounds having the following formula:



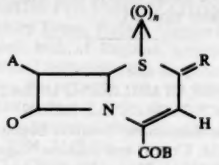
wherein A is amino, mandeloylamino, 0-formylmandeloylamino, phenoxyacetamido, phenylacetamido, α-phenylglycinamido, N-t-butoxycarbonyl-α-phenylglycinamido, or 2-thienylacetamido;

COB is carboxy, p-methoxybenzyloxycarbonyl, p-nitrobenzyloxycarbonyl, 2,2,2-trichloroethoxycarbonyl, or benzhydryloxycarbonyl;

R represets two hydrogens; methyl and hydrogen; (5-methyl-1,3,4-thiadiazol-2yl)thiomethyl and hydrogen; or methylene; and

n is zero or one

which consists essentially of treating a compound having the following formula:



wherein A, COB, R, and n are as defined above and

X is methanesulfonyloxy, benzenesulfonyloxy, toluene-p-sulfonyloxy, chlorine, bromine, or iodine,

with a metal selected from the group consisting of zinc, magnesium and aluminum in the presence of acetic acid or a mineral acid or with hydrogen in the presence of a platinum, palladium or nickel catalyst.

4,081,596

PYRAZOL-5-ONES

Eike Möller; Karl Meng, both of Wuppertal; Egbert Wehinger, Neviges, and Harald Horstmann, Wuppertal, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

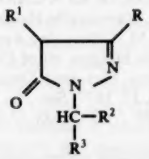
Division of Ser. No. 461,282, Apr. 15, 1974, Pat. No. 3,957,814. This application Nov. 19, 1975, Ser. No. 633,396

Claims priority, application Germany, Apr. 17, 1973, 2319280; Dec. 19, 1973, 2363139

Int. Cl.[2] C07D *231/20;* **A61K** *31/415*

U.S. Cl. 548—367 **15 Claims**

1. A compound of the formula



or a pharmaceutically acceptable, nontoxic salt thereof, wherein

R is hydrogen, lower alkyl, lower alkenyl, phenyl or trifluoromethyl;

R^1 is monoaryl unsubstituted or substituted by lower alkoxy or aralkyl wherein the aryl moiety is a monoaryl moiety and the alkyl moiety is a lower alkyl moiety, said aralkyl being unsubstituted or substituted by lower alkoxy;

R^2 is lower alkyl; and

R^3 is aryl of 6 to 10 carbon atoms substituted by:

a. 1 or 2 of the same or different substituents selected from the group consisting of halogen, trifluoromethyl, lower alkyl, lower alkenyl and lower alkoxy;

b. cycloalkyl of 5, 6 or 7 carbon atoms or cycloalkenyl of 5, 6 or 7 carbon atoms;

c. nitro; or

d. a substituent selected from the group consisting of trifluoromethyl and nitro, and 1 or 2 of the same or different substituents selected from the group consisting of lower alkyl, lower alkenyl, lower alkoxy, halogen and trifluoromethyl; or

R^3 is naphthyl.

4,081,597

PROCESS FOR THE MANUFACTURE OF PYRAZOLONES FROM PYRAZOLIDONES

Ian George Cameron Fleming, and Raymond Vincent Heavon Jones, both of Manchester, England, assignors to Imperial Chemical Industries Limited, United Kingdom

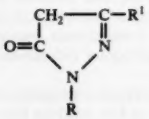
Filed Dec. 13, 1976, Ser. No. 750,158

Claims priority, application United Kingdom, Dec. 24, 1975, 52886/75

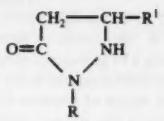
Int. Cl.[2] C07D *231/22, 231/24, 231/26*

U.S. Cl. 548—363 **9 Claims**

1. A process for manufacture of pyrazolones of the formula:



wherein R is an aromatic radical selected from the group consisting of phenyl, α- and β- naphthyl, and phenyl, α- and β-naphthyl substituted with CH_3, OCH_3, Cl, Br, NO_2, CO_2H or SO_3H and R^1 is alkyl of 1–6 carbon atoms, carboxylic acid, or carboxylic acid alkyl ester having 1 to 4 carbon atoms in the alkyl group which comprises treating a pyrazolidone of the formula:



wherein R and R^1 have the meanings stated above with hydrogen peroxide in the presence of alkali.

4,081,598

FLAME RETARDANT MERCAPTOCARBOXYLIC ACID ESTERS OF HALOGENATED POLYOLS

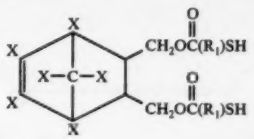
Charles R. Morgan, Brookeville, and David E. Kramm, Laurel, both of Md., assignors to W. R. Grace & Co., New York, N.Y.

Division of Ser. No. 552,674, Feb. 24, 1975, Pat. No. 4,048,218. This application May 16, 1977, Ser. No. 797,225

Int. Cl.[2] C07C *149/20, 149/22*

U.S. Cl. 560—147 **2 Claims**

1. As a composition of matter, a halogen-containing polythiol of the formula:



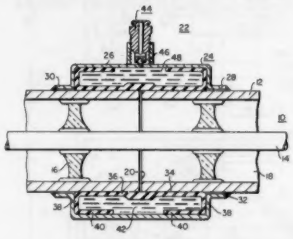
wherein X is a halogen selected from the group consisting of Cl and Br, and R_1 is an alkyl group containing 1–16 carbon atoms.

4,081,599

PIPE COUPLING AND METHOD FOR USING SAME

Alan H. Cookson, Southboro, Mass., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 13, 1976, Ser. No. 714,216
Int. Cl.[2] H01B *9/06;* **F16L** *17/00*
U.S. Cl. 174—21 C **8 Claims**



1. A coupling for sealingly connecting two sections of pipe having a gas disposed therein, said pipe sections having an outside diameter, said pipe sections being outer sheaths of a high voltage gas-insulated transmission line and having an electrical conductor insulatably supported therein, said coupling comprising:

an annular, elongated housing comprising two circumferentially continuous end sections and an intermediate section therebetween longitudinally connecting said two end sections, said end sections having an inside diameter substantially the same as said pipe outside diameter and capable of being welded thereto, said end sections extending longitudinally outwardly from said intermediate section, said intermediate section having an inside diameter greater than said pipe outside diameter, said pipe sections being disposed within said housing and forming a joint between said pipe sections, said joint being longitudinally positioned along said housing within said intermediate section, said intermediate section and said pipe sections forming an annular space therebetween;

an annular, elongated, elastic sleeve disposed within said annular space adjacent said pipe joint and contacting said pipe sections, said sleeve having radially outward extensions at the longitudinal ends thereof, said sleeve extensions being spaced from said pipe sections and extending to said housing intermediate sections and having longitudinal elements extending towards each other adjacent said intermediate sections, said longitudinal elements being radially spaced from said sleeve, said sleeve, sleeve extensions, and longitudinal elements forming a generally C-shaped configuration and having a cavity therebetween; and

means for pressurizing said cavity, the pressurization of said cavity compressing said sleeve against said pipe sections and sealing said pipe joint.

4,081,600

HIGH DENSITY THICK FOIL CIRCUITRY LAMINATED PACKAGE

Joseph A. Kueneman, Torrance; Kenneth W. Nestor, Los Angeles, and Adolph J. Miera, El Segundo, all of Calif., assignors to Buss Systems, Inc., El Segundo, Calif.

Filed Jul. 28, 1976, Ser. No. 709,457
Int. Cl.[2] H05K *1/02, 3/06*
U.S. Cl. 174—68.5 **20 Claims**

1. In the conventional process for producing a laminated package of HDTF circuitry adhesively bonded to a supporting resin layer, where said circuitry is derived by photoetching a metal blank adhesively bonded to said supporting resin layer in accordance with a pattern master transparency, the improvement consisting of:

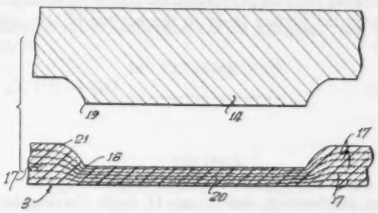
a. preforming a cavity in a precursor of a laminated board precisely to fit the pattern shape, depth, profile and dimensions of the circuitry, by

b. thermoforming with a metal form tool derived by photoetching a metal plate in accordance with the same said pattern master transparency to a depth equal to the thickness of said circuitry,

c. impressing said form tool into said precursor in a press with platens heated to about 340° F. in a modified low pressure dwell cycle consisting of a pressure of from about 9 psi to about 11 psi of net plan view area for a dwell time of from about 195 seconds to about 225 seconds,

followed by incompletely curing said precursor in a high pressure cycle unmodified, as specified by the manufacturer of the prepreg that is used in said precursor for the specific resin in his product, but interrupted short of completion of cure, and recovering a laminated board with a preformed cavity therein.

17. In a laminated board adapted to receive HDTF circuitry adhesively bonded to a supporting layer, where said circuitry is derived by photoetching a metal blank adhesively bonded to said supporting resin layer in accordance with a pattern master transparency, said laminated board being produced from a precursor of the laminated board consisting of a plurality of from about 3 to about 10 sheets of prepreg, the resin of said prepreg being in the B stage of polymerization and selected from the group consisting of epoxy and polyimide, where said laminated board is produced by the process of:



a. preforming a cavity in the precursor of said laminated board precisely to fit the pattern shape, depth, profile and dimensions of the circuitry, by

b. thermoforming with a metal tool derived by photoetching a metal plate in accordance with the same said pattern master transparency to a depth equal to the thickness of said circuitry,

c. impressing said form tool into said precursor in a press with platens heated to about 340° F. in a modified low pressure dwell cycle consisting of a pressure of from about 9 psi to about 11 psi of net plan view area for a dwell time of from about 195 seconds to about 225 seconds, followed by incompletely curing said precursor in a high pressure cycle unmodified, as specified by the manufacturer of the prepreg that is used in said precursor for the specific resin in his product, but interrupted short of completion of cure, and recovering a laminated board with a preformed cavity therein, the structural improvement wherein the imbedded woven glass fabric in the midthickness of each sheet of said plurality of sheets of prepreg cradles said cavity in a nested plurality of equally spaced layers of said woven glass fabric, and said woven glass fabric is retained in a horizontally stretched and vertically compressed condition.

4,081,601

BONDING CONTACT MEMBERS TO CIRCUIT BOARDS

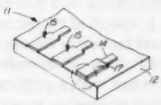
Donald Dinella, Union, and Richard M. Kovaric, Verona, both of N.J., assignors to Western Electric Co., Inc., New York, N.Y.

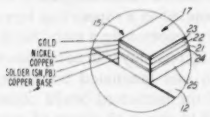
Division of Ser. No. 564,007, Mar. 31, 1975, Pat. No. 3,964,666.
This application Apr. 2, 1976, Ser. No. 672,913
Int. Cl.[2] H05K *1/07*
U.S. Cl. 174—68.5 **1 Claim**

1. A circuit board including a dielectric substrate and a circuit pattern of a conductive base formed in adhesive contact on the substrate, the pattern including at least one contact

finger having a top surface area for making contact with a connector contact, wherein an improvement comprises:

a conductive overlay solder-bonded over substantially the entire contact finger top surface area, the overlay including a layer of copper, the copper layer facing and being solder-bonded to the base, a surface layer of gold having





a top surface essentially free of solder, the gold providing a contact area for the connector contact, and a layer of nickel located adjacent and between the surface layer and the copper layer for preventing the copper from migrating through the surface layer to the surface of the contact area.

4,081,602

SELF-SUPPORTING CABLE

Zvi Paniri, Scarborough, and Thomas H. Rudd, Toronto, both of Canada, assignors to Canada Wire and Cable Limited, Toronto, Canada

Filed Mar. 3, 1976, Ser. No. 663,496
Claims priority, application Canada, Apr. 18, 1975, 224990
Int. Cl.[2] H01B *7/18*
U.S. Cl. 174—103 **8 Claims**

1. A self-supporting power cable comprising:

a. a cable core consisting of plural electrically conductive power conductors stranded together, and a filler located in the interstitial space between the conductors;

b. a unitary jacket surrounding said cable core, contacting said cable core about the entire periphery thereof, and having two diametrically opposed portions of increased overall cross-sectional thickness; and

c. at least one supporting member totally embedded into each diametrically opposed portion of increased overall thickness and disposed parallel to the longitudinal axis of the cable.

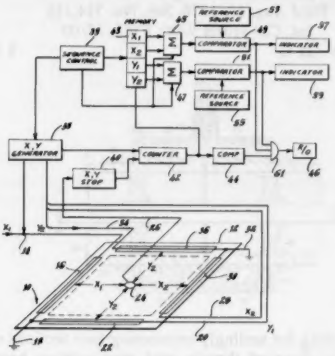
4,081,603

POSITION COORDINATE DETERMINATION DEVICE

Robert L. Davis, Prospect, and Stephen L. Domyan, Norwalk, both of Conn., assignors to Summagraphics Corporation, Fairfield, Conn.

Filed Mar. 7, 1977, Ser. No. 775,158
Int. Cl.[2] G08C *21/00*
U.S. Cl. 178—19 **13 Claims**

1. A position determination device comprising a data surface, means for generating a first datum representing the location of a position with respect to a first reference on said data surface along a linear path, means for generating a second datum representing the location of said position with respect to a second reference on said data surface along said linear path, means for adding said first and second datum to produce a third datum, means for comparing said third datum with a predetermined value representative of the distance between



said first and second references for determining the correctness of said first datum as a measure of the location of said position.

4,081,604

SUPERPOSITION RECORDING APPARATUS

Kiyoshi Kanaiwa, Machida, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 1, 1976, Ser. No. 719,677
Claims priority, application Japan, Sep. 5, 1975, 50-107826
Int. Cl.[2] G06F *3/12, 7/32, 13/00*; H04L *21/00*
U.S. Cl. 178—30 **22 Claims**

1. A superposition recording apparatus comprising:

first read-out means for reading first coded information from a first storage medium, the first coded information corresponding to information to be recorded on a recording medium as first pattern information;

first memory means for storing the first coded information read out by said first read-out means;

first dot signal generator means responsive to the first coded information from said first memory means for producing dot signals;

second read-out means for reading out second coded information from a second storage medium, the information so read out being usable for recording second pattern information on the recording medium;

second memory means for storing the second coded information read out by said second read-out means;

second dot signal generator means responsive to the second coded information from said second memory means for producing dot signals; and

recording signal forming means for combining together the

dot signals produced by said first and second dot signal generator means to form recording signals for succes-

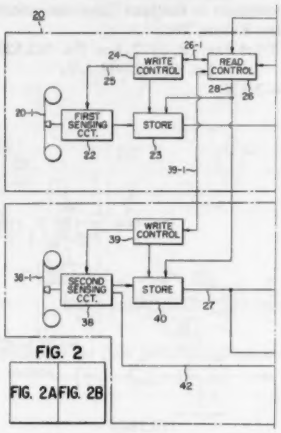
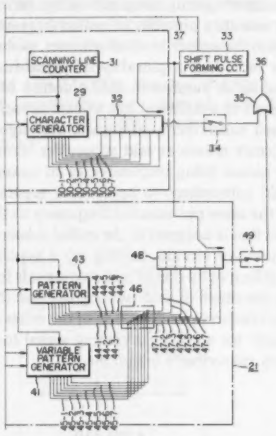


FIG. 2

FIG. 2A FIG. 2B



sively controlling formation of said first and second pattern information on the recording medium.

4,081,605
SPEECH SIGNAL FUNDAMENTAL PERIOD EXTRACTOR

Nobuhiko Kitawaki, Kodaira, and Shinichiro Hashimoto, Koganei, both of Japan, assignors to Nippon Telegraph and Telephone Public Corporation, Tokyo, Japan

Filed Aug. 18, 1976, Ser. No. 715,399

Claims priority, application Japan, Aug. 27, 1975, 50-102473

Int. Cl.² G10L *1/00*

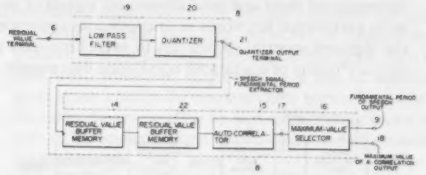
U.S. Cl. 179—1 SC **9 Claims**

1. A speech signal fundamental period extractor comprising:

means for removing unnecesary high-frequency components from a residual value of a speech wave;

means for quantizing the output signal from said high-frequency component removing means to obtain only the low-bit quantization thereof:

an autocorrelator means supplied with the low-bit quantization of the output signal from said quantizing means for calculating a correlation coefficient thereof; and



means for obtaining the fundamental period of speech by selecting the position of a maximum correlation coefficient from the output of said autocorrelator.

4,081,606
SOUND REPRODUCTION SYSTEMS WITH AUGMENTATION OF IMAGE DEFINITION IN A SELECTED DIRECTION

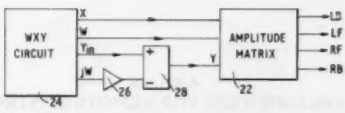
Michael Anthony Gerzon, Oxford, England, assignor to National Research Development Corporation, London, England

Filed Nov. 3, 1976, Ser. No. 738,591

Claims priority, application United Kingdom, Nov. 13, 1975, 46822/75

Int. Cl.² H04R *5/00*

U.S. Cl. 179—1 GQ **10 Claims**



1. A decoder for a sound reproduction system having at least three loudspeakers surrounding a listening area, the decoder comprising input means for receiving at least two input signals comprising pressure signal components and velocity signals comprising pressure signal components and velocity signal components of a plurality of directions, subtractor means, responsive to the input means, for subtracting from those velocity signal components of a chosen direction a directional bias signal comprising a signal all the components of which differ in phase from the pressure signal components by 90°, and output means, responsive to the input means and the subtractor means, for producing a respective output signal for each loudspeaker.

4,081,607
KEYWORD DETECTION IN CONTINUOUS SPEECH USING CONTINUOUS ASYNCHRONOUS CORRELATION

Visvaldis A. Vitols, Orange, and James E. Paul, Jr., Anaheim, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Continuation of Ser. No. 564,564, Apr. 2, 1975, abandoned. This application Nov. 1, 1976, Ser. No. 737,809

Int. Cl.² G10L *1/00*

U.S. Cl. 179—1 SB **35 Claims**

1. A system for asynchronously detecting one or more keywords in continuous speech, said system comprising:

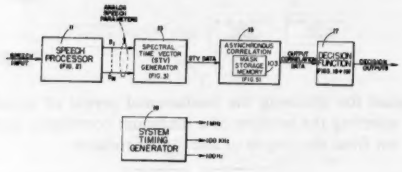
processor means responsive to a continuous speech signal for continuously developing a plurality of spectral estimates therefrom;

generator means responsive to the plurality of spectral estimates for periodically generating digitized spectral parameters therefrom;

first memory means for prestoring predetermined ones of

dyad and triad subelement signals associated with one or more preselected keywords;

correlation means for asynchronously correlating each of the prestored dyad and triad subelement signals of one or more preselected keywords with continuous sequences of the digitized spectral parameters to asynchronously produce a plurality of continuous correlation data signals; and



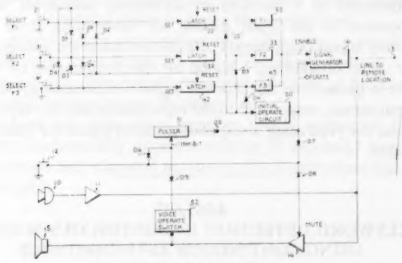
a decision means for each desired keyword, each of said decision means being responsive to associated ones of the correlation data signals for developing an occurrence decision output whenever an associated keyword has been detected.

4,081,608

ARRANGEMENT FOR REMOTE CONTROL APPARATUS

Irving E. Hodnett, Lynchburg, Va., assignor to General Electric Company, Lynchburg, Va.

Filed Dec. 17, 1976, Ser. No. 751,896
Int. Cl.² H04M *11/00*
U.S. Cl. 179—2 A **10 Claims**



1. An improved arrangement for use at a first location for controlling an apparatus at a second location comprising:

a. first means for producing a control signal for transmission to said apparatus at said second location;

b. second means connected to said first means for placing said first means in an enabled condition in response to said second means being operated;

c. third means connected between said second and first means for causing said first means, when enabled, to produce said control signal in response to said second means being operated;

d. a pulser for producing repetitive pulses;

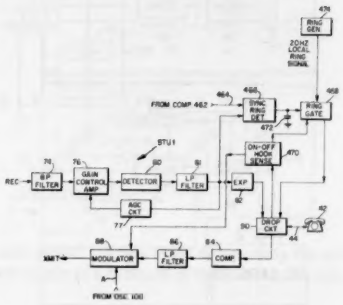
e. and fourth means connecting said pulser to said first means for causing said first means, when enabled, to produce said control signal in response to each of said pulses.

4,081,609

SYNCHRONOUS RING DETECTOR FOR STATION CARRIER TELEPHONE SYSTEMS

Gerald Wayne Beene, and Hubert C. Martin, Jr., both of Arlington, Tex., assignors to Reliance Telecommunication Electronics Company, Euless, Tex.

Filed Jan. 28, 1977, Ser. No. 763,520
Int. Cl.² H04H *1/04*
U.S. Cl. 179—2.5 R **4 Claims**



1. A plural channel amplitude modulated station carrier telephone system comprising subscriber terminal means providing service to a plurality of subscribers and adapted to be connected to the subscribers' telephones, said subscriber terminal means including a plurality of signal-responsive circuits corresponding in number to said plurality of subscribers and each assigned to a different one of said subscribers for ringing the assigned subscriber's telephone, and signalling means including circuit means at said subscriber terminal means, said signalling means being responsive to an incoming call for any one of said subscribers to apply two separate synchronized signals of the same pre-selected frequency to the signal-responsive circuit that is assigned to the called subscriber, each of said signal-responsive circuits having (a) a synchronous detector rendered effective by one of said two signals for synchronously detecting the other of said two signals and (b) means responsive to the synchronous detection of the other of said signals by said detector for applying a ringing signal to cause ringing of its assigned subscriber's telephone.

4,081,610

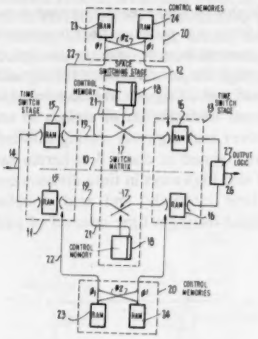
FAST ACCESS ANTIPHASE CONTROL MEMORY FOR DIGITAL DATA SWITCHES

Bartolo Valastro, Pascoe Vale, and Franko Stipcevic, Glenroy, both of Australia, assignors to L.M. Ericsson Pty. Ltd., Australia

Filed Mar. 14, 1975, Ser. No. 558,360
Claims priority, application Australia, Mar. 15, 1974, PB6928
Int. Cl.² H04J *3/00*
U.S. Cl. 179—15 AT **6 Claims**

1. A control memory for addressing locations in incoming and outgoing data switching stages in a digital data switching network, said control memory comprising first and second random access memories each having an address storage capability equal to half the maximum number of locations in each of said data switching stages, means for generating successive binary address words, means for addressing simultaneously said random access memories with said address words, two selecting means, one being associated with the incoming and the other with the outgoing data switching stages for supplying alternatively the read out contents of one or the other of said random access memories to the data switching stage associated with the selecting means, and means for supplying the most significant bit of said address words to said selecting

means, the value of said most significant bit determining from which of the random access memories the contents thereof

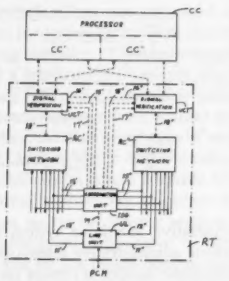


should be supplied to the data switching stage associated with the selecting means.

4,081,611
COUPLING NETWORK FOR TIME-DIVISION TELECOMMUNICATION SYSTEM

Amilcare Bovo; Giampaolo Gubertini; Luigi Musumeci, all of Milan, and Giuseppe Valbonesi, Settimo Milanese (Mi), all of Italy, assignors to Societa Italiana Telecomunicazioni SIEMENS S.p.A., Milan, Italy

Filed Apr. 13, 1976, Ser. No. 676,621
Claims priority, application Italy, Apr. 14, 1975, 22279 A/75
Int. Cl.[2] H04J *3/02*
U.S. Cl. 179—15 AT **17 Claims**



1. A coupling network for establishing temporary connections, under the control of a processor, between intercommunicating channels of a plurality of multichannel TDM links converging at a common junction, comprising:

a multiplicity of line units divided into a plurality of groups respectively associated with said links, each line unit communicating with a respective channel of the associated link for exchanging incoming and outgoing message samples therewith during a recurrent time slot assigned to the respective channel;

a pair of substantially identical switching networks;

a set of input group units in each of said switching networks respectively assigned to said links, each input group unit being connected to all the line units associated with the respective link for receiving and temporarily storing the incoming message samples thereof;

a set of output group units in each of said switching networks respectively assigned to said links, each output group unit being connected to all the line units associated with the respective link for transmitting outgoing message samples thereto;

a switching matrix responsive to routing instructions from the processor for forwarding, during a transfer interval, message samples from any input group unit to any output group unit for temporary storage preparatorily to transmission of said message samples;

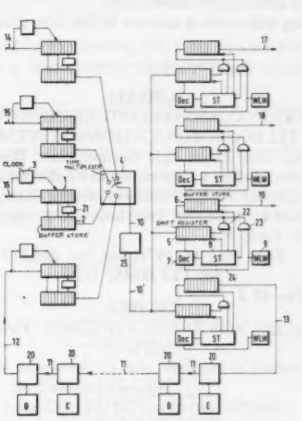
coordinating means controlled by said processor for selecting either of said switching networks in establishing a transfer path for message samples therethrough, each line unit being connected in parallel to a pair of associated input group units in the two switching networks and being alternatively connectable by said coordinating means to a pair of associated output group units in said switching networks; and

a pair of verification units communicating with the processor, said verification units being connected to said switching networks, respectively, and to said coordinating means for facilitating the exchange of information between said switching networks and the processor and for indicating alarm conditions to the processor.

4,081,612
METHOD FOR BUILDING-UP OF ROUTING ADDRESSES IN A DIGITAL TELECOMMUNICATION NETWORK

Emanuel R. Hafner, Wohlen, Switzerland, assignor to Hasler AG, Bern, Switzerland

Filed Jul. 14, 1976, Ser. No. 705,251
Claims priority, application Switzerland, Jul. 31, 1975, 9990/75; Aug. 18, 1975, 10711/75
Int. Cl.[2] H04L *15/00;* **H04Q** *9/00, 3/56*
U.S. Cl. 179—15 BA **11 Claims**



1. A method of building-up a routing address for transmission of digitally addressed packets from a first to a second subscriber's station of a transmission network having a plurality of switching nodes,

there being a plurality of subscriber's stations, including said first and second subscriber's stations, and

a plurality of lines connecting each switching node to at least one other switching node and each subscriber's station to one switching node, routing words being individually assigned to the lines, all routing words assigned to those lines which are connected to the same switching node being distinguishable from each other;

the subscriber's stations having individual call-numbers distinguishable from each other but without an indication of the switching node to which the respective subscriber's station is connected,

the method comprising the steps of:

(1) transmitting from the first subscriber's station to the switching node connected to it a build-up packet including the call-number of at least the second subscriber's station and the routing word assigned to the line which

connects the first subscriber's station to the said switching node;

(2) receiving the said build-up packet incoming at the said switching node and retransmitting it to all other switching nodes and to all subscriber's station connected to said switching node, and

continuing such receiving and retransmitting at each of said other switching nodes and from all further switching nodes to which retransmitted build-up packets arrive;

(3) before each of said retransmissions adding to the received build-up packet the routing word assigned to the line to which the received build-up packet is retransmitted.

thereby obtaining and retransmitting along different routes of the network an increasing number of different build-up packets each containing the call-number of the second subscriber's station and a build-up routing address consisting of the sequence of the routing words assigned to the lines successively passed along the respective route by each respective build-up packet, the lengths of the routing addresses increasing from switching node to switching node along the routes;

(4) excluding from said retransmissions build-up packets exceeding a predetermined packet length corresponding to a route length which is sufficient for transmission from any subscriber's station to any other subscriber's station of the network;

(5) comparing at each subscriber's station the second subscriber's call-number of each incoming build-up packet with the call-number of the respective subscriber's station and, when the compared call-numbers are identical, receiving the incoming build-up packet received by the second subscriber's station; and

(6) storing said routing address in the first subscriber's station.

4,081,613

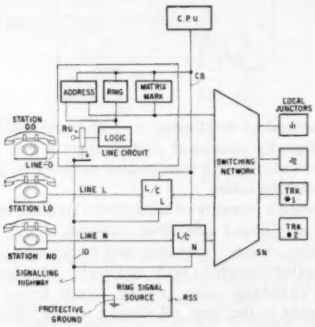
BI-DIRECTIONAL SIGNALLING ARRANGEMENT FOR TELECOMMUNICATIONS SYSTEMS

Jose Reines, Glen Ellyn; Eric Gordon Platt, Darien; Stanley Earl White, Hoffman Estates; Robert John Mahood, Arlington Heights, and Joseph Michael Corrado, Chicago, all of Ill., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed May 14, 1976, Ser. No. 686,377

Int. Cl.[2] H04M *3/02*

U.S. Cl. 179—18 J **5 Claims**



3. A telephone system having lines directed to stations, a central processor for processing calls to and from said stations over said lines, and a line circuit individual to each line, said line circuits being grouped to provide stations of similar types within a group, a plurality of metallic signaling highways with each highway commonly coupled to one of said line circuit groups, each of said highways including a pair of conductors for signaling to said stations and at least one conductor for receiving signals from said stations, a plurality of sources including a source of special signals, means responsive to information from the processor directed to a selected one of said line circuits for closing a multiple conductor path from a ringing source to a highway, and means responsive to other information received from said processor for interrupting said path to said ringing current source and means for completing a metallic path through the conductors of the signalling highway from said source of special signals to said seleced line circuit to enable bidirectional transmission of signals to and from said selected source over said highway during said interruption.

4. A system as claimed in claim 3, wherein said processor controls each of said highways in time division control during predetermined time intervals, and said coupling of other sources is prevented during a time interval of path closure.

4,081,614

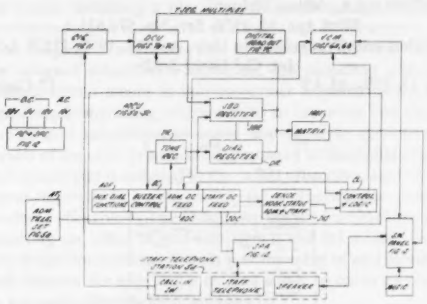
SUPERVISED SINGLE LINK TELEPHONE SYSTEM

James E Dahlquist, Elk Grove Village, and Dilip T. Singhi, Skokie, both of Ill., assignors to Rauland-Borg Corporation, Chicago, Ill.

Filed Apr. 14, 1977, Ser. No. 787,608

Int. Cl.[2] H04M *5/20*; H04Q *3/64*

U.S. Cl. 179—18 AD **19 Claims**

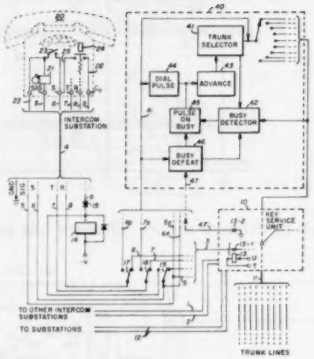


1. In an administrative telephone system the combination comprising a dialable administrative telephone set, a plurality of dialless staff telephone stations at remote room locations and having identifying numbers, means including a central exchange for interconnecting the administrative telephone set with the staff telephone stations, a digital display device associated with the administrative telephone set having a column of display positions, a call-in switch at each staff telephone station for signalling a desire to communicate with the administrator, means in the central exchange responsive to operation of one of the switches for causing the identifying number of such staff telephone station to be displayed at the head of the column in the digital display device accompanied by an alarm signal, means in the central exchange responsive to successive operation of the switches at other ones of the staff telephone stations for causing the identifying numbers of such staff telephone stations to be displayed in successive positions on the digital display device, means in the central exchange responsive to the dialing of a displayed number for causing the administrative telephone set to be connected to a staff telephone station or corresponding number for the carrying on of a conversation, and means in the central exchange for causing the dialed number to be extinguished and for causing each of the numbers in successive positions on the digital display device to move fowardly one step in the column of display positions.

4,081,615
SUBSET SWITCHING MEANS IN APPARATUS FOR A KEY TELEPHONE SYSTEM FOR ENABLING INTERCOM SUBSTATIONS TO ACCESS TRUNK LINES

Steven Jon Hoehn, Redwood City, Calif., assignor to Litton Business Telephone Systems, Inc., Sunnyvale, Calif.

Division of Ser. No. 587,361, Jun. 16, 1975, Pat. No. 4,016,372.
This application Nov. 29, 1976, Ser. No. 745,543
Int. Cl.² H04Q 3/00
U.S. Cl. 179—18 FA 4 Claims



1. A selection device for connecting one of a plurality of electrical input circuits to a single electrical output circuit comprising:

a plurality of switch means, one associated with each of said input circuits for initiating a circuit selection;

a corresponding plurality of electromagnetic relay means, each having a winding;

a corresponding plurality of transistor means, each of said transistor means having a base, emitter and collector;

means connecting the associated ones of said switch means, said emitter, said collector and the relay winding in an electrical series circuit across a source of voltage;

gate means normally providing an output to the base of all said transistor means for biasing same to a current conducting condition and responsive to operation of more than one of said switch means concurrently for providing an output to the base of each of said plurality of transistor means to bias all said transistor means in the noncurrent conducting condition during simultaneous operation of more than one switch means;

whereby operation of a single one of said switch means completes a current conducting path through the emitter of the associated transistor means and through the associated relay winding in series to energize said relay means;

a plurality of holding circuit means responsive to operation of an associated one of said relay means for completing an electrical holding circuit to the associated winding thereof to maintain said relay means operated irrespective of the current conducting condition thereafter of the associated transistor means; and

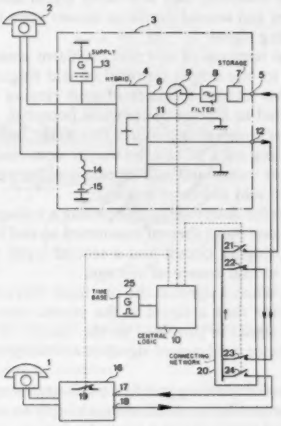
inhibit means responsive to any one of said relay means being in the operated condition for providing an output to the base of all said transistor means to bias said transistor means into the concurrent conducting condition;

a plurality of relay contact means, one contact means associated with each relay means and with one of said circut inputs and said single electrical output, for completing an electrical circuit between a respective input and the output.

4,081,616
METHOD OF AND APPARATUS FOR ELIMINATING THE SIDE TONE OF A TELEPHONE STATION

Alain G. Dumont, Montceau-les-Mines, France, assignor to Jeumont-Schneider, Puteaux, France

Filed Jun. 9, 1976, Ser. No. 694,344
Claims priority, application France, Jun. 11, 1975, 75 18182
Int. Cl.² H04M 1/58
U.S. Cl. 179—81 A 10 Claims



1. A method for eliminating side tones of a telephone station operating in a time-division sampling mode comprising the steps of:

(a) receiving signal samples representing a message transmitted by a second station;

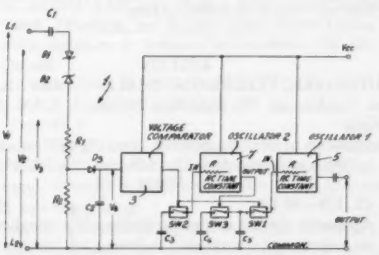
(b) restoring the transmitted message from the received sampled signals, and

(c) interrupting the restored signal at predetermined intervals, thereby removing side tones from said telephone station.

4,081,617
ELECTRONIC RINGING CIRCUIT FOR TELEPHONE SYSTEMS

Jeremy Clark, Montreal, Canada, assignor to Technex International Ltd., St. Laurent, Canada

Filed Oct. 29, 1976, Ser. No. 737,016
Int. Cl.² H04M 1/00
U.S. Cl. 179—84 T 4 Claims



1. An electronic ringing circuit having two input terminals, and two output terminals connectable to speaker means, and comprising:

means for determining when a telephone ringing signal is present at said input terminals and for providing an acti-

vating signal when said telephone ringing signal is present at said input terminals;

first oscillator means, said oscillator means having an output terminal and providing output signals at a plurality of frequencies one at a time;

means for changing the frequency of the output signals of said first oscillator means;

second oscillator means having an output terminal connected to said means for changing the frequency of the output signals of said first oscillator means;

means for receiving said activating signal and for enabling said first and second oscillator means upon receipt of said activating signal;

the output terminal of said first oscillator means being connected to one output terminal of said ringing circuit and the other output terminal of said ringing circuit being connected to a point of common potential;

and further comprising a source of voltage, and terminals for connecting each of said means for determining, said first oscillator means and said second oscillator means respectively to said source of voltage;

said means for determining comprising a voltage comparator having one input thereof connected to one input terminal of said ringing circuit and a second input terminal connected to said source of voltage;

whereby, when a signal at the one input thereof is of greater magnitude than a signal at the second input thereof, an output signal is provided at the output of said voltage comparator, said output signal constituting said activating signal;

said means for enabling said first oscillator means comprising a first controllable switch means having an input terminal, an output terminal and a control terminal, and said means for enabling said second oscillator means comprises a second controllable switch means having an input terminal, an output terminal and a control terminal;

a first capacitor means connected between the input terminal of said first switch means and said point of common potential;

the output terminal of said first switch means being connected to said first oscillator means;

the output terminal of said voltage comparator being connected to the control terminal of said first switch means;

a second capacitor means connected between the input terminal of said second switch means and said point of common potential;

the output terminal of said second switch means being connected to said second oscillator means;

the output terminal of said voltage comparator being connected to the control terminal of said second switch means;

whereby, when an activating signal is provided at the output of said voltage comparator, the first and second switch means are closed to connect said first and second oscillator means to said point of common potential to enable said first and second oscillator means.

4,081,618

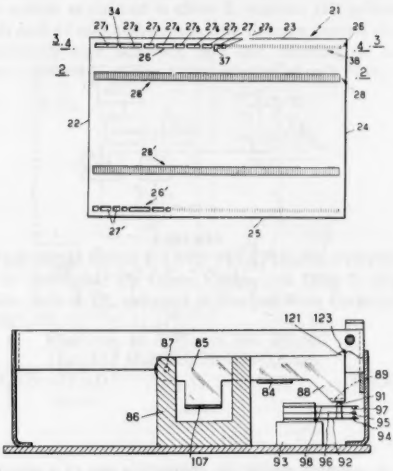
AUTOMATIC TELEPHONE DIALLING APPARATUS

Dante Vendramini, 17, Rue Jean Dussourd, 92600 Asnieres, France

Continuation of Ser. No. 566,762, Apr. 10, 1975, abandoned.
This application Sep. 13, 1976, Ser. No. 722,993
Int. Cl.[2] H04M *1/48*
U.S. Cl. 179—90 CS **16 Claims**

1. Apparatus for the automatic dialling of a telephone number, said apparatus comprising a frame, an aperture in said frame for the introduction of a support carrying in code the figures of the number to be dialled, means for moving said support at a constant velocity relative to said frame, a first feeler co-operable with a continuous first track on said support, effective to produce a train of impulses, and a second feeler co-operable with a second track of said support, said second track being characteristic of the number to be dialled, the cooperation between the first feeler and the first track being controlled by the second feeler, and means for stopping said support at a predetermined position, said means for stopping said support comprising a locking lever co-operable with a third track on said support.

3. A card for use in an automatic telephone dialling apparatus comprising a card body, means defining a first rectilinear continuous track in said body for the generation of impulses, and co-operable with a first feeler in the apparatus, means



defining a second rectilinear track in said body parallel to the first track and discontinuous as a function of the number to be called, said second track being co-operable with a second feeler which controls the operation of said first feeler, aid second track comprising a succession of aligned rectilinear cavities, of which each has a length which corresponds to a figure of the number to be called, said successive cavities being separated by flats of the same length, and further comprising a third track co-operable with a third feeler effected to stop said card.

4,081,619

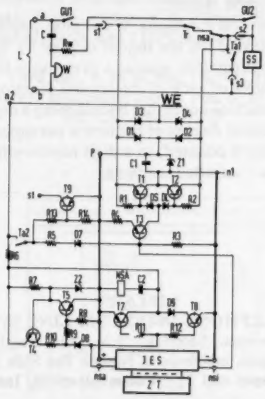
SWITCHING ARRANGEMENT FOR TELECOMMUNICATION SUBSCRIBER STATIONS USING KEY-OPERATED SELECTION UNITS

Helmut Losehand, Dachau, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Sep. 17, 1976, Ser. No. 724,096
Claims priority, application Germany, Sep. 19, 1975, 2541903
Int. Cl.[2] H04M *1/272*
U.S. Cl. 179—90 K **4 Claims**

1. In a switching arrangement for subscriber stations of a telephone system each fed via the central office line thereof and each having a key-controlled dialing unit with three terminals for connection to the central office line and for ready replacement of a dialing unit, said dialing unit having impulse contacts formed by a semiconductor controlled unit, a transmission and feed circuit established upon depression of one of the keys thereof, and a bistable relay operable to its operative state when a key is depressed to disconnect the subscriber speech circuit from the central office line and connect the dialing unit thereto, the improvement comprising a high resistance operating circuit incuding actuating means for said bistable relay connected in parllel to said transmission and feed circuit and operable to change the relay to its quiescent condition if it is in its operating condition upon actuation of the

station, and means for inhibiting said operating circuit from returning the relay to its quiescent condition upon first depression of a key and thereafter for the duration of the dialing operation.

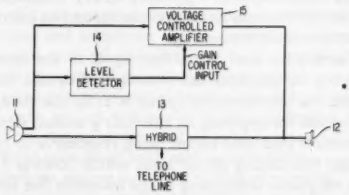


4,081,620

SIDETONE CONTROL CIRCUIT FOR A TELEPHONE SET

David Joel Goodman, Summit; James David Johnston, N. Plainfield, and A. Michael Noll, Stirling, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 20, 1977, Ser. No. 798,786
Int. Cl.² H04M *1/58*
U.S. Cl. 179—81 A **6 Claims**



1. In a telephone set having a transmitter and a receiver, an improvement CHARACTERIZED IN THAT

sidetone coupling means are connected between said transmitter and said receiver wherein said sidetone coupling means comprises

a controllable-gain circuit having an input port, an output port and a gain control port,

first means connecting said input port to said transmitter,

second means connecting said output port to said receiver, and

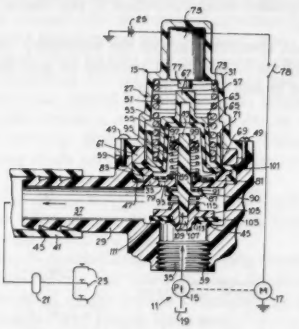
third means connecting said control port to said transmitter to increase the gain of said circuit as a monotonically increasing function of the output level of said transmitter.

4,081,621

PRESSURE SWITCH WITH DIAPHRAGM AND VALVE MEANS

Ezra Dale Hartley, Los Angeles, Calif., assignor to Carr-Griff, Inc., Anaheim, Calif.

Filed Apr. 26, 1976, Ser. No. 680,190
Int. Cl.² H01H *35/34*
U.S. Cl. 200—83 Q **14 Claims**



1. A pressure switch usable with a source of fluid under variable pressure comprising:

means defining a chamber;

first passage means for providing communication between the source of fluid under variable pressure and the chamber;

check valve means associated with said first passage means for allowing flow of fluid from the source through the first passage means to the chamber and for substantially preventing flow of fluid from the chamber through the first passage means to the source;

actuator means responsive to the pressure in the chamber for assuming a first position in response to a first pressure in the chamber and for assuming a second position in response to a second pressure in the chamber;

switch means responsive to the actuator means being in said first position for being in a first state and responsive to the actuator means being in said second position for being in a second state; and

pressure relief valve means responsive to the pressure in said chamber and the pressure of the source for reducing the pressure in said chamber in response to the pressure in the chamber exceeding the pressure of the source by a predetermined magnitude.

4,081,622

ELECTRONIC CIRCUIT FOR A SPEAKERPHONE

Jeremy Clark, Montreal, and Robert Allen, Pointe Claire, both of Canada, assignors to Technex International Ltd., St. Laurent, Canada

Filed Oct. 29, 1976, Ser. No. 737,015
Int. Cl.² H04M *1/60*
U.S. Cl. 179—81 B **6 Claims**

1. An electronic circuit arrangement for a speakerphone having a first input terminal and a second input terminal, said second input terminal being connected to a line of common potential, and comprising:

a first series circuit including said first input terminal, a first variable impedance, the primary winding of a transformer, and a second variable impedance, and terminating at said line of common potential;

a microphone having an output connected to the input of a microphone amplifier;

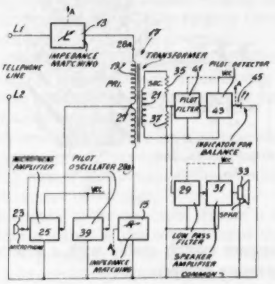
said microphone amplifier having one terminal connected to said line of common potential, and having an output termi-

nal connected to a point in said primary of said transformer;

a second series circuit including a filter, having an input terminal, an output terminal and a ground terminal, a speaker amplifier having an input terminal, an output terminal and a ground terminal, and a speaker having an input terminal and a ground terminal;

said ground terminals of said filter, said speaker amplifier and said speaker being connected to said line of common potential;

circuit means connected across the secondary winding of said transformer, said input terminal of said filter being connected to said circuit means;



said output terminal of said filter being connected to said input terminal of said speaker amplifier, and said output terminal of said speaker amplifier being connected to said input terminal of said speaker;

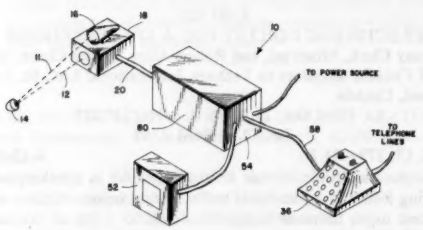
whereby, when said first series circuit is in a balanced condition, said circuit arrangement is in a balanced condition and the output of said microphone amplifier will not appear at the secondary winding of said transformer, but an input signal present of the input terminals of said circuit arrangement will be impressed on said secondary winding from said primary winding.

4,081,623

SIGHT OPERATED TELEPHONE AND MACHINE CONTROLLER

Arthur W. Vogeley, Yorktown, Va., assignor to Bio-Systems Research, Inc., Yorktown, Va.

Filed Nov. 15, 1976, Ser. No. 742,106
Int. Cl.² H04M 1/26
U.S. Cl. 179—90 BD **11 Claims**



10. A method of performing machine control functions by the use of an operator's eye movements comprising:

aiming a radiation source in the direction of an operator's eye;

capturing the reflection of the radiation from the operator's eye with a radiation sensor sensitive to the radiation of the radiation source which generates an electrical signal dependent upon the presence or absence of reflected radiation;

counting the interruptions in the electrical signal generated by the radiation sensor;

controlling several functions of a digital display and a sequencing device for the digital display by matching the count of interruptions against a previously selected code for the control of each of the several functions; and

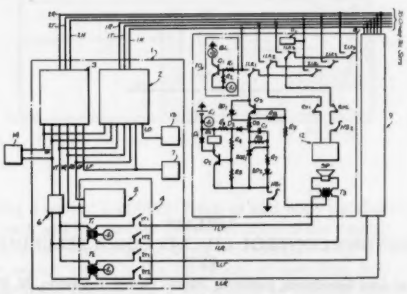
operating a machine controller by matching a digit displayed upon the digital display at the time a particular number of interruptions is counted, to a digit representing a specific action by a controlled machine.

4,081,624

KEY TELEPHONE INTERCOM LINE SYSTEM

Stephen E. Kerman, Merrick, N.Y., and Fumio Tsutsumi, Takasaki, Japan, assignors to Nippon Tsu Shin Kogyo K.K., Kawasaki, Japan and TIE/Communications, Inc., Stamford, Conn.

Filed Sep. 21, 1976, Ser. No. 725,340
Int. Cl.² H04M 1/72
U.S. Cl. 179—99 **10 Claims**



7. A key telephone intercom line circuit comprising

at least one key telephone intercom line set of leads, each set of leads comprising two talking circuit leads and one control lead, for a total of three leads, said three leads being connectable to a plurality of key telephone sets by means of intercom line key contacts, and an intercom line control circuit comprising

(a) means for applying a first signal to the control lead when no telephone set is connected to said three leads and the intercom line circuit is in an idle state,

(b) means for applying an alternating second signal to the control lead, said means being responsive to current in said two talking circuit leads which flows as a result of a telephone connecting to the intercom line set of leads from an idle state, said condition being called the calling state,

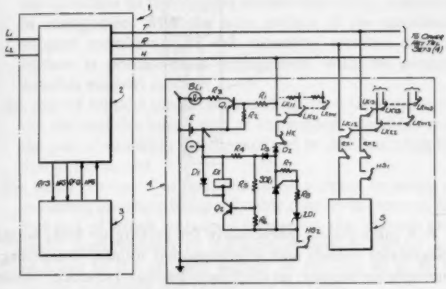
(c) means for generating and applying a call alerting signal over a separate telephone selection control circuit means to a called telephone set in response to calling address signals via said two talking circuit leads generated by said calling telephone during said calling state, and

(d) means for disconnecting said call alerting signal from said called telephone and for establishing a fourth signal on said control lead, said means being responsive to a third signal generated by the called telephone set and applied to said control lead when said called telephone is answered in response to said call alerting signal, the condition being called the answer state.

4,081,625
CONTROL CIRCUITRY FOR KEY TELEPHONE APPARATUS

Fumikazu Hamatani; Mikihiro Ichikawa, and Yuji Tanaka, all of Kawasaki, Japan, assignors to Nippon Tsu Shin Kogyo K.K., Kawasaki, Japan and TIE/Communications, Inc., Stamford, Conn.

Filed Oct. 1, 1976, Ser. No. 728,514
Claims priority, application Japan, Feb. 3, 1976, 51-10492
Int. Cl.[2] H04M *1/72*
U.S. Cl. 179—99 **8 Claims**

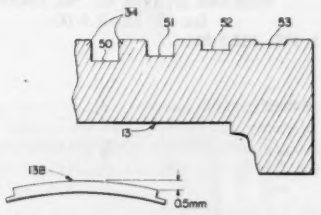


1. In a key telephone system comprising,
a main apparatus having one central office line circuit for each central office line connected to the main apparatus, said central office lines and central office line circuits being connected together,
one set of talking pair leads and a control lead connected to each of said central office line circuits,
a plurality of key telephone stations, each of which has means for being electrically connected to two or more sets of talking pair leads and a control lead, each of said key telephone stations having,
a plurality of status indicators, each of the indicators corresponding to a particular central office line for which the station has connecting means,
hookswitch contacts,
switching means for holding the connected central office line.
a source of periodically interrupted first and second signals for periodically enabling and disabling said indicators,
improved control circuitry for each central office line comprising,
central office line control circuitry associated with said main apparatus and telephone station control circuitry associated with each telephoen station, said central office lin control circuitry and said telephone station control circuitry being interconnected by one control lead associated with each pair of talking leads, said indicators in each telephone station corresponding to the central office lines also being associated with said control leads,
said telephone station control circuitry comprising,
signal generating means for generating a control signal on said control lead when said telephone station is connected to the corresponding central office line and for removing said control signal on said single control line when said telephone station is placed on hold after having been connected to said central office line,
said central office line control circuitry comprising,
first detection means for generating a first detection signal only during the presence of
(1) an unanswered incoming ringing signal voltage on said central office line,
(2) a talking current flow when a key telephone station is connncted to said central office line via said talking lead pair, or
(3) a hold condition,
second detection means for generating a second detection signal when said control signal appears on said single control line,
first circuit means for enabling the application of said first interrupted signal onto said single control lead in order to enable said indicator only if said first detection signal occurs but said second detection signal has not occurred,
second circuit means for enabling the application of said second interrupted signal onto said single control lead in order to enable said indicator only if said first detection signal remains after said second detection signal has first occurred and then has been removed, and
means responsive to said first and second detection signals for controlling the interconnection of said talking lead pair to said central office lead pair, wherein said first detection means is a photocoupler device comprising a light emitting diode and a photo-transistor, said light emitting diode emitting light in response to signal conditions in said central office line of,
(1) alternating current voltage in said central office pair line when an unanswered incoming ringing signal is present
(2) direct current during the talking condition on said central office line when the key telephone station is connected to the central office line by means of the corresponding talking leads and,
(3) direct current in said central office line when the key telephone station places the line on hold after being in the talking state, said photo-transistor being placed in a conductive state in response to light from said light emitting diode on the occurrence of said signal conditions on said central office line.

4,081,626
ELECTROSTATIC TRANSDUCER HAVING NARROWED DIRECTIONAL CHARACTERISTIC

Juerg Muggli, Woburn, and Manfred G. Specht, Newton, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Nov. 12, 1976, Ser. No. 741,228
Int. Cl.[2] H04R *19/00*
U.S. Cl. 179—111 R **23 Claims**



1. An electrostatic sonic transducer comprising a backplate, a layer of conductive material stretched over one major surface of said backplate with an insulating layer interposed between said conductive layer and said backplate said backplate being formed of substantially non-conductive material having a metallized coating extending across said one major surface and at least portions of said opposite major surface thereof, said backplate carrying indentations at its periphery for providing metallized connections between said one and said opposite surfaces, and means for connecting an external voltage source to said portions of said coating on said opposite major surface.

8. An electrostatic sonic transducer comprising a relatively inflexible support plate having at least one major surface thereof formed of conductive material so as to provide a first conductive layer and a relatively flexible layer of conductive material forming a second conductive layer stretched across said one major surface with a layer of insulative material disposed between said second conductive layer and said one major surface, said one major surface being defined by a plurality of projections spaced apart by intervening grooves, and the

crest of said projections include substantially uniform surface variations formed by substantially uniform striations.

9. An electrostatic sonic transducer comprising a relatively inflexible support plate having at least one major surface thereof formed of conductive material, a relatively flexible layer of conductive material stretched across said one major surface with a layer of insulative material disposed between said flexible conductive layer and said one major surface, said major surface being formed so that portions thereof in contact with said insulative material define a generally convex curvature to provide reliable contact between said layers, said one major surface being defined by a plurality of projections spaced by intervening grooves, the crest of one said projection deviating from said convex curvature as compared to an adjacent or next adjacent projection to define an undulating convex curvature of said one major surface.

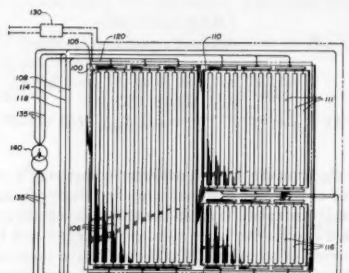
13. An electrostatic transducer comprising a relatively inflexible support plate having at least one major surface thereof formed of conductive material, a relatively flexible layer of conductive material tightly stretched across said one major surface with a layer of insulative material disposed between said conductive material and said one major surface, said major surface being defined by a series of projections spaced apart by intervening grooves, and the configuration of said projections and grooves being optimized for maximum output at a given frequency near the center of said one major surface and varied from said optimum near the periphery thereof so as to reduce the side lobe radiation of said transducer.

4,081,627

ELECTROMAGNETIC BIPOLAR LOUD SPEAKER

Scott D. Crist, Hopkins, Minn., assignor to Audio Research Corporation, Minneapolis, Minn.

Filed Dec. 27, 1976, Ser. No. 754,510
Int. Cl.² H04R 9/00
U.S. Cl. 179—115.5 PV **10 Claims**



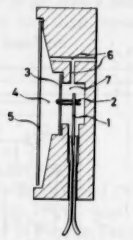
1. An electromagnetic current sheet transducer comprising: a taut diaphragm of dielectrical material having a vibratable area positioned on a planar frame; a plurality of conductors positioned on the vibratable area of the diaphragm in spaced parallel relationship; an electrical bus positioned on the planar frame displaced from said diaphragm; a plurality of connector means for individually connecting the conductive strips to said bus; and a single magnetic field means generating a uniform magnetic field around the surface of the diaphragm and over the surface of the diaphragm normal to the direction of current flow through the conductors on the diaphragm.

4,081,628

MICROPHONE, PARTICULARLY FOR BODY SOUNDS, WITH SLIP COUPLING TO THE TRANSDUCER ELEMENT

Rolf Neusel, Hugelstrasse 69, D-6100 Darmstadt, Germany

Filed Dec. 1, 1976, Ser. No. 746,325
Claims priority, application Germany, Dec. 5, 1975, 2554777
Int. Cl.² H04R 1/46, 17/02
U.S. Cl. 179—121 R **6 Claims**



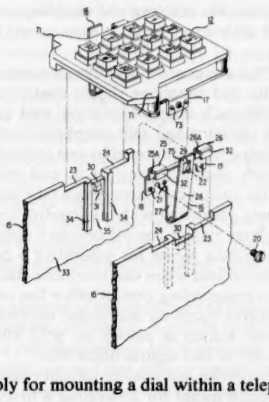
1. A microphone, particularly for picking up body sounds, underwater sounds and air-transmitted sounds, comprising a microphone housing; an electromechanical transducer element mounted in the housing; an interior diaphragm mounted in the housing; a slip coupling connecting the interior diaphragm to the transducer element for transmitting forces from the former to the latter; an exterior diaphragm mounted in the housing and defining together with the interior diaphragm an intermediate coupling space through which vibrations of the exterior diaphragm are transmitted to the interior diaphragm.

4,081,629

SNAP-IN BRACKET FOR MOUNTING A TELEPHONE DIAL WITHIN A TELEPHONE HOUSING

James Owen Benesh, and Donald Eric Still, both of Indianapolis, Ind., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 27, 1976, Ser. No. 735,990
Int. Cl.² H04M 1/02
U.S. Cl. 179—178 **11 Claims**



1. An assembly for mounting a dial within a telephone housing comprising

a pair of spaced upstanding support members extending in generally parallel planes, each support member having a height and including

a portion having a support surface at the upper end thereof extending generally orthogonal to the height of the support member, and

a catch portion located adjacent to the support surface, the

catch portion including a stop surface facing in the opposite direction to the support surface;

a dial having a pair of mounting members disposed on opposite sides thereof for securing the dial between the support members with a surface of the dial exposed, the mounting members being identical to one another and each mounting member including

a support surface for resting on the support surface of the associated support member, and

a catch portion located adjacent to the support surface, the catch portion including a stop surface facing in the opposite direction to the support surface and being positioned in engagement with the stop surface of the associated support member when the mounting member support surface is positioned in engagement with the support member support surface;

the pair of support members providing the total support for the dial and the interaction of the support members with the pair of mounting members of and by itself securing the dial in place, and

the catch portion of at least one of the support members or mounting members being a flexible cantilever element, the free end of which includes a release tab that extends generally perpendicular to the support surface thereof and adjacent to the exposed surface of the dial so as to be readily accessible and deflectable by hand.

4,081,630

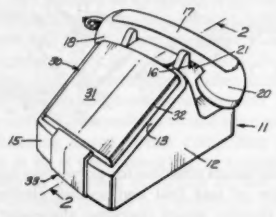
TELEPHONE DISABLING DEVICE

Joseph W. Washburn, 16562 Iris Dr., and Thomas A. Ashton, 9659 Cypress Ave., both of Fontana, Calif. 92335

Division of Ser. No. 669,234, Mar. 22, 1976, abandoned. This application Jan. 14, 1977, Ser. No. 759,431

Int. Cl.[2] H04M *1/66*

U.S. Cl. 179—189 R **1 Claim**



1. A telephone disabling device for use on a telephone of the type having a body, including a pair of laterally spaced, horizontal ledges separated by a central plane surface at a slightly lower level, each of the ledges having a pair of spaced apart uprights which cooperate with the ledges to form a cradle to receive the handset of the telephone, and the phone body having a recess extending into the back side thereof directly below the central plane surface, said disabling device comprising:

a strip-like member bent by substantially right-angle bends to form first, second, third and fourth sections, said first section lying flat on the central plane surface of the phone body beneath the handset when the latter is resting in the cradle, said first section extending from the rear edge of the plane surface to a point just in front of the handset;

said second section extending upwardly from the front edge of said first section, in front of the handset;

said third section extending rearwardly over the top of the handset in close proximity thereto;

said fourth section extending downwardly from the rear edge of said first section, directly behind the rear edge of the central plane surface; and

a lock mounted on said fourth section and having a retractable part that projects into the recess below the central plane surface;

said lock part engging the roof of the recess to prevent the said member from being raised with respect to the phone body; said second second section engaging the front of the handset to prevent the disabling device from moving rearwardly; and said third section preventing the handset from being lifted out of the cradle.

4,081,631

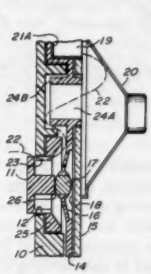
DUAL PURPOSE, WEATHER RESISTANT DATA TERMINAL KEYBOARD ASSEMBLY INCLUDING AUDIO PORTING

Alvin Feder, Lauderhill, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 8, 1976, Ser. No. 748,616

Int. Cl.[2] H01H *9/00*; G10K *10/00*

U.S. Cl. 200—5 A **8 Claims**



1. A dual purpose, weather resistant data terminal keyboard arrangement suitable for use in electronic apparatus which includes audio transducer means, the arrangement comprising:

a housing cover having a plurality of apertures selectively arranged therein;

a multiplicity of key buttons having normal and depressed positions and supported immediately adjacent the rearmost side of the housing cover, each including a portion projecting through one of the housing cover apertures, the portions having apertures extending from above the upper surface of the housing cover to below the lower surface when the key button is in the normal position;

a switching assembly positioned closely adjacent the rearmost side of the housing cover and having portions adjacent the key buttons spaced apart therefrom when said key buttons are in the normal position, the assembly having switches thereon for cooperating with the key buttons to close circuits in the apparatus, the assembly having apertures therethrough non-aligned with the housing cover and key button apertures; and

wherein when the transducer means is positioned immediately adjacent the rearmost end of the switching assembly apertures, weather protection for and indirect sound paths to the transducer means are provided through the apertures in the housing cover, the key buttons and the switching assembly.

4,081,632

CAM OPERATED SWITCH HAVING WAVY SPRING CONTACT ASSEMBLY ABUTTING STOP OR FIXED CONTACT THEREBY STORING KINETIC ENERGY PRIOR TO SUBSEQUENT ENGAGEMENT WITH A FIXED CONTACT ASSEMBLY

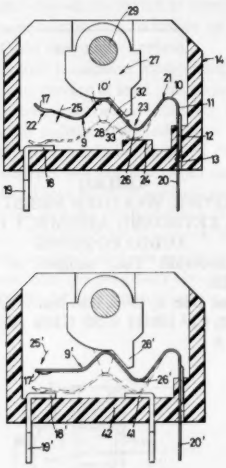
Alois Schäffeler, Spaichingen, Germany, assignor to Firma J. & J. Marquardt, Germany

Filed Oct. 28, 1975, Ser. No. 626,273

Claims priority, application Germany, Oct. 26, 1974, 2451034

Int. Cl.² H01H *21/80, 1/06*

U.S. Cl. 200—6 BB **16 Claims**



1. An electric switch comprising a housing, at least one fixed contact in said housing, at least one resilient movable contact in said housing having a fixed end secured on said housing and an opposite movable end with a contact portion held by said movable end in a position spaced from said fixed contact, a supporting member in said housing located between said movable and fixed ends of said movable contact and on the same side of said movable contact as said fixed contact, and actuating means engageable with said movable resilient contact intermediate its length on a portion thereof between said supporting member and said fixed contact to move it towards said support member and said fixed contact, said intermediate portion of said movable contact including a portion extending in the direction of said support member, said support member being located in a position to be engageable with said movable contact intermediate portion by movement of said actuating means in a direction to move said contact portion into engagement with said fixed contact, said support member engaging said intermediate portion before said movable contact is engaged with said fixed contact and said actuating means bearing against said movable contact so as to bias it into engagement with said fixed contact by deflecting it downwardly from said support member.

4,081,633

MULTI-FUNCTION ELECTRICAL SWITCH ASSEMBLY

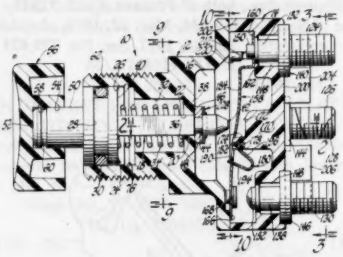
David W. Bull, Hersey, Mich., assignor to Nartron Corporation, Reed City, Mich.

Filed Mar. 15, 1976, Ser. No. 666,746

Int. Cl.² H01H *13/36*

U.S. Cl. 200—67 DA **9 Claims**

1. An electrical switch assembly, comprising first and second relatively fixed electrical conductor means spaced from each other, third electrical conductor means operatively connected to said first conductor means and normally spaced from said second electrical conductor means, resilient restraining means operatively connected to said third electrical conductor means and normally resiliently maintaining said third electrical conductor means spaced from said second electrical conductor means, actuator means effective for creating a force against said resilient restraining means so as to cause said third electrical conductor means to move toward said second electrical conductor means and thereby complete a first electrical circuit portion from said first conductor means through said third conductor means to said second conductor means, fourth and fifth relatively fixed electrical conductor means spaced from each other, and sixth electrical conductor means carried by said actuator means and normally spaced from said fourth and fifth conductor means, said sixth conductor means being effective when moved by said actuator means to operatively engage and complete a second electrical circuit portion from said fourth electrical conductor means through said sixth electrical conductor means to said fifth electrical conductor means, said actuator means comprising axially movable plunger means, second resilient means effective to resiliently urge said plunger means in a first direction away from said third conductor means, and manually engageable actuating means adapted to be manually engaged and actuated as to thereby move said plunger means in a second direction toward said third conductor means, said sixth conductor means comprising a generally medially supported leaf-type contact means having first and second electrical contact portions, said leaf-type contact means being generally medially affixed to said plunger means as to be carried thereby and movable therewith in said first and second



directions, guide means effective for preventing undue relative angular rotation of said first and second electrical contact portions as to thereby assure operative alignment as between said first and second electrical contact portions and said fourth and fifth fixed electrical conductor means, said leaf-type contact means comprising a generally medially situated main body portion, first and second contact leg portions respectively carried by their respective one ends by said main body portion as to generally both radiate outwardly therefrom and extend in said second directon, said first electrical contact portion being carried at least near a free end of said first contact leg portion, said second electrical contact portion being carried at least near a free end of said second contact leg portion, and said first and second contact portions being effective to respectively engage and wipe across said fourth and fifth conductor means when said plunger means has been sufficiently axially moved in said second direction, said third conductor means comprising a spring-like cantilevered contact means having a first end anchored against movement and electrically connected to said first conductor means and having a second swingable end normally spaced from and movable toward and into engagement with said second conductor means, said cantilevered contact means being situated as to be generally transverse to said leaf-type contact means and between said first and second contact leg portions, said first and second contact leg portions being generally spaced from each other as to be respectively at opposite sides of said cantilevered contact means thereby bridging said cantilevered contact

means when said first and second contact portions engage said fourth and fifth conductor means.

4,081,634

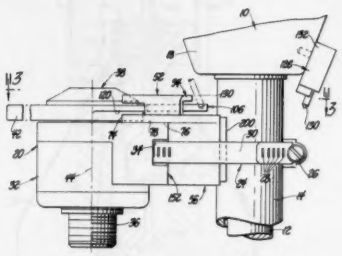
TURN SIGNAL ASSEMBLY SELF-CANCELLING MEANS AND OVERRIDE MEANS

Dale L. Bull, Reed City, Mich., assignor to Nartron Corporation, Reed City, Mich.

Continuation-in-part of Ser. No. 565,480, Apr. 7, 1975, Pat. No. 4,013,850. This application Oct. 6, 1976, Ser. No. 730,226

Int. Cl.[2] H01H *3/16, 9/00;* B60Q *1/00*

U.S. Cl. 200—61.27 12 Claims



1. A turn signal switch and assembly for an associated vehicle having manually controlled vehicular steering gear means and steering gear column housing means, comprising turn signal switch housing means for enclosing and containing actuatable electrical switching members therein, rotatable selector lever means carried by said switch housing means generally externally thereof, said selector lever means being selectively manually rotatably positionable into a neutral position and any of a plurality of operating positions as to thereby accordingly actuate said switching members within said switch housing means, abutment means operatively carried by said selector lever means as to be situated externally of said switch housing means, motion transmitting means situated generally externally of said switch housing means and having a first portion in operative juxtaposition to said abutment means, said motion transmitting means further comprising a second portion adapted to be at times operatively engaged by actuating means moving in response to indicia of said steering gear means being actuated to steer said associated vehicle in a nonlinear path, said actuating means being effective when said selector lever means has been selectively positioned in one of said operating positions corresponding to a left-turn operation of said associated vehicle and when said steering gear means is being actuated in a right-turn direction to engage said motion transmitting means and thereby forcibly cause said motion transmitting means to react against said abutment means to thereby cause said selector lever means to be rotated from said one of said operating positions to said neutral position, and support body means situated externally of said switch housing means, said support body means being separate from said switch housing means and effective to support said motion transmitting means, said support body means comprising first mounting surface means effective for operative mounting engagement with said column housing means externally thereof and second mounting surface means effective for operative mounting engagement with said switch housing means as to thereby position said switch housing means externally and eccentrically of said column housing means, said motion transmitting means and said actuating means cooperatively comprising escapement means enabling said selector lever means to be manually held and maintained in said one of said operating positions even when said steering gear means is actuated in said right-turn direction a distance exceeding that which results in engagement as between said actuating means and said motion transmitting means.

4,081,635

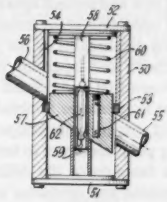
ELECTRICAL SWITCH RESPONSIVE TO A PREDETERMINED FLUID FLOW

Edward H. Moore, Avon, Conn., assignor to DeLaval Turbine Inc., Princeton, N.J.

Filed Mar. 19, 1976, Ser. No. 668,509

Int. Cl.[2] H01H *35/38*

U.S. Cl. 200—81.9 M 19 Claims



1. A flow-indicator switch, comprising a valve body having an internal cavity between aligned bores of inlet and outlet ports, a valve member having an elongate external circumferentially continuous cylindrical surface, guide means coacting between said body and valve member for guiding said valve member on an axis transverse to the alignment axes of said ports between a first position substantially intercepting the geometrical figure defined by and between the bores of said ports and a second position substantially removed from said first position, said body including a bridge member within the cavity of said body and oriented generally in a plane intermediate the alignment axis of said ports and the valve-member guide axis, said bridge member in said plane fully traversing both said geometrical figure and the path of movement of said valve member and having a bore in clearance relation with said path of movement, polarized magnetic means carried by said valve member, and magnetically sensitive electric switch means carried by said body at a location to respond to proximity of said magnetic means near one to the exclusion of the other of said valve-member positions.

4,081,636

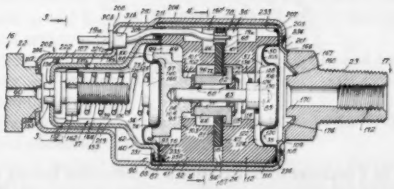
DIFFERENTIAL PRESSURE CUTOUT SWITCH

Paul Patrick Rice, Elkhart, Ind., assignor to Johnson Controls, Inc., Milwaukee, Wis.

Filed Mar. 3, 1976, Ser. No. 663,621

Int. Cl.[2] H01H *35/34*

U.S. Cl. 200—83 Y 17 Claims



1. In a differential pressure sensing device operable to provide first and second control outputs as a function of the difference between first and second pressures supplied to first and second pressure inlets thereof, said sensing device comprising housing means, first pressure operating point means including a first pressure diaphragm disposed within said housing means enclosing a first portion of said housing means adjacent one end thereof to define a first pressure chamber, second pressure operating point means including a second pressure diaphragm disposed within said housing means enclosing a second portion of said housing means adjacent another end thereof to define a second pressure chamber, said first and second pressure diaphragms defining a third chamber intermediate said first and

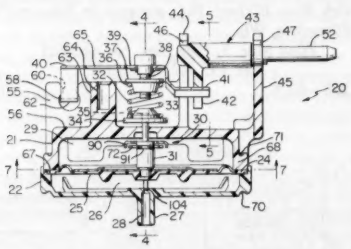
second chambers, said first and second operating point means including respective first and second operating point members disposed in said third chamber adjacent the center portion of said first and second diaphragms, respectively, spacer means enclosed within said housing means and located in said third chamber, the peripheral edges of said first and second diaphragms being clamped between said spacer means and an inner surface of said housing means, operator means mechanically coupled to said first and second operating point members, said first and second operating point members transferring the force provided on said diaphragms by the pressures in said first and second chambers to said operator means to move said operator means between first and second positions as a function of the difference in pressures established in said first and second chambers, said spacer means cooperating with said first and second operating point members to limit movement of said operator means as a function of the difference between said first and second pressures, and contactor switch means including switch actuator means coupled to said operator means to operate said switch means to provide said first control output whenever said operator means is at a position other than said one position.

4,081,637

PRESSURE OPERATED SWITCH CONSTRUCTION HAVING A ONE-PIECE BASE AND CONTROL SHAFT BRACKET STRUCTURE

John W. Stearley, Indiana, Pa.; Paul M. Rowley, Bexley, Ohio, and Thomas M. Buckshaw, Indiana, Pa., assignors to Robertshaw Controls Company, Richmond, Va.

Filed Jun. 21, 1976, Ser. No. 697,707
Int. Cl.² H01H 35/34
U.S. Cl. 200—83 WM **10 Claims**



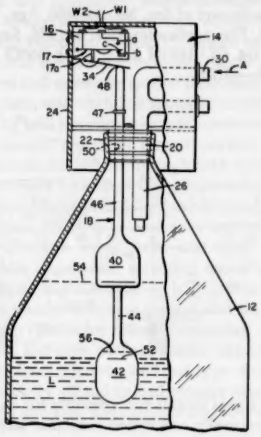
1. In a pressure operated switch construction having a generally cup-shaped base carrying a pressure operated diaphragm adjacent the open end thereof and an electrical switch unit controlled by said diaphragm and an adjustable compression spring controlled by a cam operated actuator leaf pivotally carried by said base adjacent the closed end thereof, the improvement wherein said base has integral bracket members extending from said closed end thereof whereby said base and said bracket members comprise a one-piece plastic structure, said bracket members each having integral snap means, and a cam shaft unit snapped into said snap means of said bracket members to be rotatable carried thereby, said cam shaft unit having a cam means for operating on said actuator leaf to position the same, said cam shaft unit also being a one-piece plastic structure.

4,081,638

LEVEL CONTROL WITH FLOAT ACTUATED SWITCH

William B. Thorn, Parkersburg, W. Va., and Jonathan G. Tobelmann, Corning, N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Oct. 26, 1976, Ser. No. 735,372
Int. Cl.² H01H 35/18
U.S. Cl. 200—84 R **10 Claims**



1. Apparatus for determining when at least two predetermined heights of the surface level of a liquid within a container are obtained, the apparatus comprising:

a float assembly including upper and lower float portions, means for connecting said upper and lower float portions at all times in a fixed vertically spaced apart spatial relationship, and a shaft extending upwardly from said upper float portion;

means positioned above a body of liquid for guiding the shaft portion of said float assembly, said guiding means permitting the float assembly to move upwardly and downwardly in relation to the surface level of the liquid to be determined;

normally closed switch means mounted above the upper end of the float shaft for actuation by said upper end;

said lower float portion being capable of buoyantly suspending said float assembly in said body of liquid but incapable of exerting sufficient force on said switch means to open said normally closed switch;

said upper float portion being capable of supplying sufficient force with said lower float portion to open said normally closed switch and determine an upper liquid level; and

said lower float portion being capable upon the lowering of the liquid level to allow said switch means to revert to its normally closed position and thus determine a lower liquid level.

4,081,639

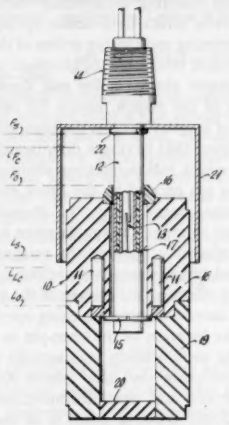
LIQUID-LEVEL FLOAT SWITCH CONSTRUCTION

Charles Tice, Plantsville, Conn., assignor to DeLaval Turbine Inc., Princeton, N.J.

Filed Jan. 19, 1977, Ser. No. 760,573
Int. Cl.² H01H 35/18
U.S. Cl. 200—84 C **8 Claims**

1. A liquid level float-switch construction, comprising a hollow upstanding elongate guide stem of non-magnetic flux-conducting material, said stem being closed at its lower end and containing a magnetic-reed switch with electrical lead connections thereto via the upper end of said stem, means at said upper end for fixedly mounting said stem, float means closed at its lower end and having a central bore for guided

reception of said stem, permanent-magnet means fixedly carried by said float means and operative to change the state of said switch in the course of vertical movement of said float means with respect to said stem, and circumferentially continuous seal means coacting between said float means and an upper



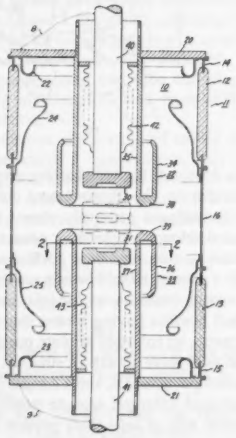
end formation on said stem and at an upper elevation above the elevation of changing the state of said switch, whereby liquid entry into the region of float guidance by said stem is avoided even in the presence of sloshing wave action at the surface of the liquid.

4,081,640

COMPACT VACUUM SWITCH FOR HIGH VOLTAGE CIRCUIT INTERRUPTION

Joseph A. Rich, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Apr. 19, 1976, Ser. No. 678,294
Int. Cl.² H01H *33/66*
U.S. Cl. 200—144 B **8 Claims**



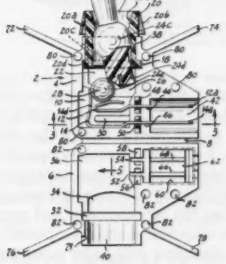
1. A vacuum arc discharge device comprising:
a hermetically sealed evacuated envelope having first and second opposed, conductive end walls;
first and second central butt contacts, said contacts abutting each other when carrying normal load current, said first contact being retractable toward said first end wall and being electrically connected thereto, and said second contact being electrically connected to said second end wall; and
first and second electrode assemblies being coaxially situated about said first and second butt contacts, respectively, and being electrically connected to said first and second end walls, respectively, each of said electrode assemblies including a pair of coaxial walls and conductive means interconnecting said coaxial walls at their innermost ends, said first butt contact being retractable into the region enclosed by the inner coaxial wall of said first electrode assembly, respectively, said first and second electrode assemblies being fixedly separated from each other by a predetermined distance.

4,081,641

TOGGLE SWITCH WITH HINGED SPLIT HOUSING AND INSULATION PIERCING CONTACTS

Earl T. Piber, Oconomowoc, Wis., assignor to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed Nov. 26, 1976, Ser. No. 745,475
Int. Cl.² H01H *1/16, 3/32, 9/02*
U.S. Cl. 200—153 LA **10 Claims**



1. A snap-action toggle switch comprising:
a one-piece insulating housing having two complementary housing halves connected by a thin section hinge enabling said housing halves to be folded together and secured to one another, and a switch cavity and a terminal cavity within said housing, and slots between said switch cavity and said terminal cavity;
stationary contact means in said switch cavity and having terminal portions extending through said slots into said terminal cavity;
a round movable contact in said switch cavity for bridging said stationary contacts;
a snap-in bushing clamped between said housing halves and having external snap-in means for mounting the switch in a hole in a mounting panel;
a toggle lever mounted in said snap-in bushing and having a V-shaped inner end portion for actuating said round movable contact between closed and open positions with respect to said stationary contact means;
insulation piercing means on said terminal portions;
and means in said housing affording limited pivoting of said stationary contact means thereby to raise said terminal portions thereof to enable insertion of insulated conductor means therebelow, and pressing of said terminal portions back into their normal position causes said insulation piercing means to make electrical connection to the conductor means.

4,081,642

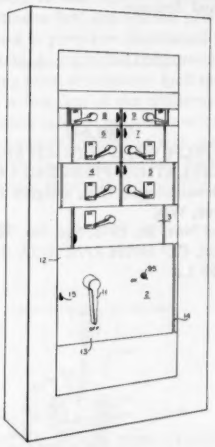
SWITCH CONSTRUCTION AND OPERATING MECHANISM THEREFOR

James O. Rexroad, Beaver, and Louis N. Ricci, Beaver Falls, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 485,677, Jul. 3, 1974, abandoned, and Ser. No. 3,41,637, Dec. 19, 1972, abandoned, and Ser. No. 130,376, Apr. 1, 1971, abandoned. This application Nov. 19, 1975, Ser. No. 633,190

Int. Cl.[2] H01H *3/00*

U.S. Cl. 200—153 G **3 Claims**



1. An electrical switch comprising a relatively flat switch-box enclosure and a cooperating metallic hinged flat switch-cover hinged to one lateral side of the relatively flat switch-box enclosure, a rotatable manually operable operating handle rotatably mounted on the external outer side of the flat switch-cover, a slotted linearly movable operating slide secured to the inner side of the flat switch-cover and operatively connected with the outer-disposed manually operable operating handle, one or more electrical pole-units mounted internally of said relatively-flat switch-box enclosure upon the base portion thereof, each pole-unit having a relatively stationary contact and a cooperable movable contact, means defining an over-center toggle switch-operating mechanism mounted upon the base portion of the relatively flat switch-box enclosure and comprising a pair of upstanding, laterally spaced metallic support-plates extending substantially transversely of the flat switch-cover, a stop-pin extending across the upper forward ends of said two upstanding metallic support plates and collectively serving as a stop for the opening movement of said movable contact, a pair of cooperative "L"-shaped operating levers pivotally mounted upon aligned fixed pivots located near the base of the two upstanding metallic support plates and having a movable operating pin interconnecting the upper ends of two cooperating first legs of the "L"-shaped operating levers, said operating pin mating in cooperative relationship with said linearly movable slotted slide to be operated thereby in the opening and closing directions longitudinally of the respective pole-unit, means pivotally mounting the movable contact for opening and closing rotative action, said over-center toggle mechanism effecting actuation of said movable contact including a pair of interconnected toggle-links pivotally connected together at a knee-joint, means defining a rotatable releasable toggle-pivot support (**65**), said releasable toggle-pivot support (**65**) being rotatable about a fixed pivot located at the upper ends of the two upstanding metallic support plates and intermediate the length thereof, one end of one of the toggle-linds (**37**) being pivotally connected to the pivotally mounted movable contact, the other end of the other toggle-link (**38**) being pivotally connected to said releasable movable toggle-pivot support (**65**), a pair of toggle-tension springs connected at one end to said knee-pin and at the other end (**49**) thereof to the extremity of the other two cooperating second legs of the "L"-shaped operating levers, the operation of the external handle means effecting longitudinal motion of said operating pin to thereby effect over-center spring throw of said toggle links for opening and closing action of the separable contacts, a portion of said releasable toggle-pivot support (**65**) serving as an over-center abutment for said knee-pin in the open-circuit position of the switch, means for releasing said releasable toggle-pivot support to open the separable contacts, said toggle-pivot support (**65**) having a downwardly directed resetting tail portion which makes resetting abutment with the said second operating pin carried by the outer extremities of said second cooperating legs of the "L"-shaped operating levers to thereby effect resetting the toggle-pivot support (**65**), latching means for releasably latching the releasable toggle-pivot support (**65**), and tripping means for releasing said latching means for thereby effecting the release of the toggle-pivot support (**65**) to effect thereby tripping opening operation of the separable contacts, the location of the knee-pin in the closed-circuit position of the switch being substantially lateral of a straight line interconnecting the fixed pivots for the "L"-shaped operating levers and said second-mentioned pin, whereby during a closed welding position of the separable contacts, the pair of toggle-tension springs will exert a strong biasing action to bias the operating pin and hence the slide to a "closed" indicating position as reflected visually on the outer manually-operable handle.

4,081,643

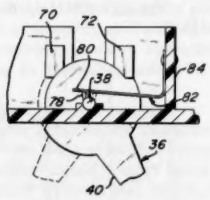
BEARING MEANS FOR A ROTATABLE MEMBER

Ted L. C. Kuo, Fanwood, N.J., assignor to Thomas & Betts Corporation, Elizabeth, N.J.

Filed May 17, 1976, Ser. No. 687,337

Int. Cl.[2] H01H *3/04*

U.S. Cl. 200—153 G **10 Claims**



5. In a wiring device of the type having a housing containing switch contacts therein, the improvement comprising: an integral structure including a generally planar base portion and selectively spaced sidewalls extending generally normal to the plane of said base portion, said base portion and said sidewalls forming at least a portion of said housing; a toggle member for actuating said switch contacts, said toggle member comprising an elongate shaft portion having means thereon for actuating said switch contacts, an enlarged arcuate portion affixed to said shaft portion so as to have an axis of rotation generally coincident with the shaft portion axis, and a handle portion extending outwardly from said enlarged arcuate portion generally normal to the central axis of said shaft portion for manipulating said toggle member; spaced first bearing elements located on said base portion and having open recesses therein slidingly receiving and supporting said shaft portion; and second bearing elements located on said sidewalls and spaced above said base portion, said second bearing elements slidingly engaging said enlarged arcuate portion of said toggle member, said toggle member being restrained between said first and said second bearing elements.

4,081,644

ELECTRICAL CONTACT MATERIAL

Terrence Ardern Davies, Encino, Calif., assignor to Plessey Handel Investments A.G., England

Continuation-in-part of Ser. No. 373,594, Jun. 25, 1973, abandoned. This application Oct. 9, 1975, Ser. No. 621,241
Claims priority, application United Kingdom, Jun. 29, 1972, 30461/72
Int. Cl.[2] H01H 1/02
U.S. Cl. 200—266 14 Claims

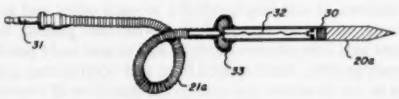
1. An electrical contact material which consists of at least one material selected from a first group which comprises any one of the precious metals, gold, palladium, ruthenium, rhodium and rhenium or their alloys and the silver/palladium series of contact alloys; and not more than three weight percent of at least one material selected from a second group which comprises occluded compounds of lithium, sodium, potassium, rubidium, caesium and cadmium, spread uniformly throughout, or formed at discrete sites at the surface of the at least one material of the first group, and a hardening metal when gold is combined with a compound of the second group.

4,081,645

TEMPERATURE CONTROLLED MICROWAVE OVEN

Wallace Raymond Javes; Calvin Andre Hagberg, and Harold Coulston Anderson, all of Minneapolis, Minn., assignors to Litton Systems, Inc., Beverly Hills, Calif.

Filed Oct. 30, 1975, Ser. No. 627,146
Int. Cl.[2] H05B 9/06
U.S. Cl. 219—10.55 B 4 Claims



1. In combination:
A microwave oven including an oven cavity;
a microwave energy source coupled to supply microwave energy to said cavity;
a temperature probe adapted to be embedded into a material to be heated in said cavity, said probe including a metal tube portion having a thermistor contained therein, a plug portion adapted for connection to a receptacle provided in a wall of the oven cavity, and a flexible metal conduit portion interconnecting said tube and plug portions and incorporating an electrical lead from said thermistor to said plug portion;
control means electrically connected to said probe including means for selecting a temperature, said control means being arranged in the electrical circuit of said microwave energy source whereby said source is interrupted when the temperature of said probe reaches said selected temperature; wherein said conduit portion is encased in a flexible, non-metallic coating having a lower sensible heat transfer rate than the underlying metal.

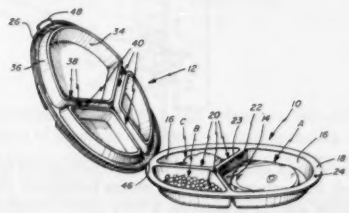
4,081,646

DEVICE FOR MICROWAVE COOKING

Costas E. Goltsos, Weston, Mass., assignor to Teckton, Inc., Wellesley, Mass.

Filed Mar. 15, 1976, Ser. No. 666,665
Int. Cl.[2] H05B 9/06
U.S. Cl. 219—10.55 E 1 Claim

1. An apparatus for heat conditioning a multi-component meal by microwave energy comprising:
a tray formed from a material which is transparent to microwave energy, said tray including a bottom wall, an upwardly extending peripheral wall and ridge means extending upwardly from the bottom wall and being connected to the peripheral wall to define a plurality of tray compartments, the upper end of the tray peripheral wall terminating in a tray rim;
a cover formed from a material which is transparent to microwave energy, said cover having a peripheral rim constructed and arranged to engage and interlock with the tray rim, said cover having a top wall disposed above the level of the cover rim and a compartment wall extending downwardly from the periphery of the top wall, said compartment wall terminating below the level of the cover rim, said cover further having a peripheral wall connected to the lower end of the compartment wall and extending upwardly therefrom to the level of the cover rim, said cover rim being connected to the upper end of the peripheral wall of the cover;
said peripheral walls of said cover and tray being constructed and arranged to enable them to be mated when the cover and tray are combined;
said cover further including ridge means extending downwardly from the top wall and being connected to the cover compartment wall, said cover ridge means including a pair of paralleling spaced ridges defining channel means receptive to the tray ridge means when the cover is



in place on the tray, said cover ridge means extending downwardly into the tray compartments to engage the side walls of the tray ridge means, the externally facing surface of said cover ridge means defining a radially extending groove;
and a microwave energy shielding means comprising:
a shielding box having top and bottom walls and an end wall, said box having means to removably insert said container therein;
means defining radiation transparent apertures in the walls of the shielding box at predetermined locations so that when the container is inserted into the shielding box in a predetermined orientation, selected of the radiation transparent apertures will be in alignment with selected portions of the container; and
means mounted to and within the shielding box, said guide means being constructed and arranged to be received within the external radially extending groove of the container cover and being further constructed and arranged as to preclude insertion of the container other than in an inverted, cover-down attitutde and with the tray in said predetermined orientation.

4,081,647

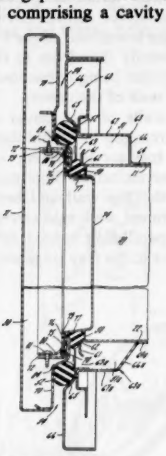
ENERGY SEAL FOR A MICROWAVE OVEN

Sumner Hale Torrey, West LaFayette, Ind., assignor to Roper Corporation, Kankakee, Ill.

Filed May 10, 1976, Ser. No. 684,663
Int. Cl.[2] H05B 9/06
U.S. Cl. 219—10.55 D 16 Claims

1. In a microwave oven having an enclosure forming a cavity with an access opening into said cavity, a hinged door for closing said access opening, said door in its closed position mating said enclosure and forming a gap at the door-enclosure interface surrounding said access opening, said door-enclosure interface having an enclosure-interface surface and a door-interface surface, a source of microwave energy, means supplying said microwave energy to said cavity, and an energy

seal coextensive with the door-enclosure interface surrounding said access opening; wherein the improvement comprises: the energy seal comprising in combination, a primary, tube-like capacitive seal positioned in the gap in said door-enclosure interface proximate said cavity, said capacitive seal including an inner metallic layer encompassed by an outer dielectric layer, said layers being compressible but exerting an outward force when compressed so that said primary seal conforms to and fills a portion of the gap in the door-enclosure interface, a secondary choke seal comprising a cavity of predetermined



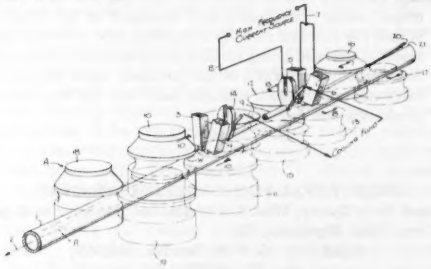
depth having an aperture into said gap outboard of said capacitive seal, resilient outboard seal means positioned outboard of said choke seal for presenting a very small impedance to the transmission path following said secondary seal, and means for biasing the door toward the enclosure in the door closed position, whereby closing of said door serves to compress said primary and outboard seals, causing said primary and outboard seals to conform to said gap encompassing said secondary seal thereby to minimize leakage of microwave energy from said cavity.

4,081,648

HIGH FREQUENCY IN-LINE, ELECTRICAL WELDING APPARATUS FOR SMALL DIAMETER METAL TUBING

Wallace C. Rudd, New Canaan, and Humfrey N. Udall, Darien, both of Conn., assignors to Thermatool Corporation, Stamford, Conn.

Filed Feb. 4, 1977, Ser. No. 765,653
Int. Cl.[2] B23K *31/06*
U.S. Cl. 219—59.1 **14 Claims**



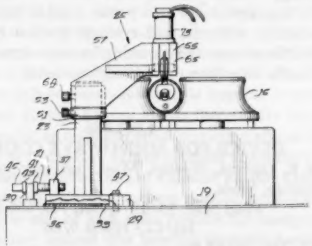
1. Apparatus for welding together at a weld point the edges of a thin metal strip formed substantially into a small diameter tube with said edges extending longitudinally of the tube, said apparatus comprising means for longitudinally advancing said tube toward said weld point, a pair of downstream electrical contacts engageable with said tube and disposed adjacent said weld point, one of said pair of contacts being engageable with said tube at one of said edges thereof and the other of said pair of contacts being engageable with said tube at the other of said edges thereof, a pair of upstream electrical contacts engageable with said tube and spaced from said downstream pair of contacts by a distance sufficient to permit said edges to reach welding temperature as they reach said weld point, one of said upstream pair of contacts being engageable with said tube at one of said edges thereof and the other of said second pair of contacts being engageable with said tube at the other of said edges thereof, a source of electrical current of a frequency of at least 50 kilohertz, means connecting one terminal of said source to both of said upstream contacts, means connecting the other terminal of said source to both of said downstream contacts, said last-mentioned means including a proximity conductor extending from adjacent said upstream contacts to said downstream contacts in closely spaced relation to the path of both said edges as they are advanced from said upstream contacts to said downstream contacts, each contact of said upstream and said downstream contacts being independently movable toward and away from, and being urged toward, said tube, one contact of said pair of downstream contacts being movable along a path which extends substantially parallel to a first plane parallel to and intersecting the longitudinal axis of said tube and the other contact of said pair of downstream contacts being movable along a path which extends substantially parallel to a second plane parallel to and intersecting the longitudinal axis of said tube but which extends at an acute angle to said first plane and one contact of said pair of upstream contacts being movable along a path which extends substantially parallel to a third plane parallel to and intersecting the longitudinal axis of said tube and the other contact of said pair of upstream contacts being movable along a path which extends substantially parallel to a fourth plane parallel to and intersecting the longitudinal axis of said tube but which extends at an acute angle to said third plane, and means for controlling the positions of said edges relative to each other and to said proximity conductor comprising downstream guiding means adjacent said downstream contacts and at said weld point and upstream guiding means spaced from said downstream guiding means in the direction opposite to the direction of advance of said tube by a distance no greater than the distance between said upstream contacts and said weld point, each of said guiding means having a surface engageable with said tube for maintaining said edges in opposed relation and both said surface of said upstream guiding means and said surface of said downstream guiding means being shaped, in cross-section, to maintain said tube with a non-circular cross-section as it is advanced from said upstream guiding means to said downstream guiding means.

4,081,649

SEAM ROLLER FOR TUBE MILL

Frank Tonkovich, Riverdale, Ill., assignor to Allied Tube & Conduit Corporation, Harvey, Ill.

Filed Aug. 4, 1976, Ser. No. 711,528
Int. Cl.[2] B23K *31/06*
U.S. Cl. 219—61.1 **11 Claims**



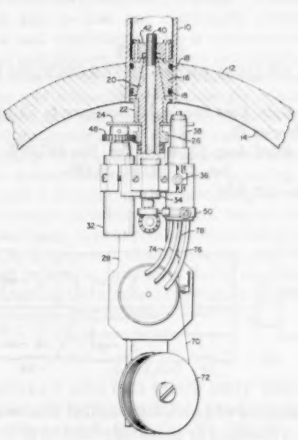
1. The combination of a tube mill for rolling a metallic strip into a circular cross section tubular shape, a circular rotating electrode device for welding the edges of said strip together at a seam, and means supported within said welded continuous tube for rolling said seam, wherein the improvement comprises said seam-rolling means including an arm extending into said tube which is being formed and carrying a roller which is rotatively supported thereon, said arm being located so that

said roller contacts said seam at a position just downstream from the point where welding occurs, connector means affixed to said arm extending outward of said tube which is being formed through the region between the converging edges of said strip to a location where it is pivotally mounted on pin means carried by a support, force-applying means also carried by said support and located to bear against said arm in a manner to rock said arm about said pivot pin and force said roller against the interior surface of said hot seam in general alignment with said circular welding device so that the still hot weld metal is rolled to a smooth finished surface, a pipe carried by said arm having an open and directed downstream toward said roller, which pipe terminates at a location upstream of the point of welding, and means for providing fluid flow through said pipe so as to displace weld spatter downstream past said roller while simultaneously cooling said roller.

4,081,650
AUTOMATIC SEAL WELDING APPARATUS

John Joseph Barger, Ringgold, Ga.; Milton Lee Blevins, Chattanooga, and Dennis Edward Savor, Hixson, both of Tenn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Oct. 4, 1976, Ser. No. 729,248
Int. Cl.² B23K *9/02*
U.S. Cl. 219—60 A **5 Claims**



1. An apparatus for seal welding a tube to the inside surface of a header comprising:

a. a welding torch having a tip;

b. a mandrel having an axis;

c. centering means for concentrically supporting said mandrel from the tube to be seal welded;

d. a journal bearing supporting said welding torch, with the welding torch tip adjacent the tube end to be seal welded, while permitting torch tip movement generally radial to the axis of said mandrel;

e. support means rotatably mounted on said mandrel for supporting said journal bearing;

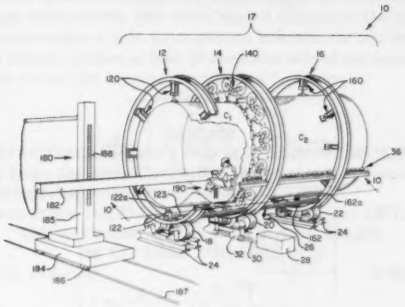
f. a first electric motor supported on said support means with its axis parallel to the axis of said mandrel for rotating said support means around the axis of said mandrel, a planet gear operatively attached to the rotor of said first electric motor and a meshing sun gear rigidly attached to said mandrel; and

g. oscillating means for oscillating said torch about the axis of said journal bearing.

4,081,651
APPARATUS METHOD FOR WELDING TANK SECTIONS

Robert W. Randolph, St. Charles, and Steven L. Jantzen, St. Louis, both of Mo., assignors to ACF Industries, Incorporated, New York, N.Y.

Filed May 6, 1976, Ser. No. 683,662
Int. Cl.² B23K *31/06*
U.S. Cl. 219—61 **24 Claims**



1. Apparatus for supporting and rotating a pair of hollow tank sections of generally circular cross section during welding of the sections in end-to-end abutting relation to form an elongated tank comprising:

three longitudinally spaced, axially aligned, rotatable rings including a center ring and a pair of side rings mounted on each side of the center ring; said center ring including a plurality of circumferentially spaced, radially directed center jacks each extendible the same distance regardless of the resistance encountered by a particular jack to force the abutting edges of the tank sections into precise circular cross section, and support and hold the abutting edges in aligned relation during rotation and welding; said side rings including circumferentially spaced radially directed side jacks of the seek-and-find type that automatically extend until all jacks exert the same force on the tank sections extending from each side of the center ring to thereby support the tank sections for rotation about the common axis of the three rings; and means for rotating said rings about said common axis, and welding means for circumferentially welding the abutting edges of said tank sections during rotation.

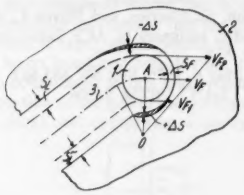
4,081,652
ELECTRICAL DISCHARGE MACHINING BY MEANS OF A WIRE ELECTRODE

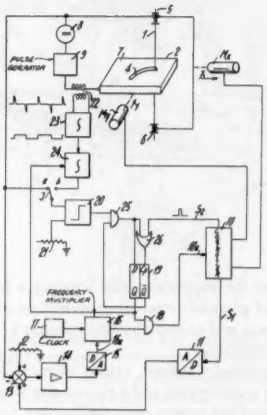
Johann Jänicke, La Chapelle Rambaud, France, and Georges-Andre Marendaz, Meyrin, Switzerland, assignors to Ateliers des Charmilles, S.A., Geneva, Switzerland

Filed Jul. 26, 1976, Ser. No. 708,606
Claims priority, application Switzerland, Aug. 13, 1975, 10516/75
Int. Cl.² B23P *1/08*
U.S. Cl. 219—69 W **18 Claims**

1. In a process for machining a workpiece electrode by means of intermittent electrical discharges applied between a wire electrode and said workpiece electrode, wherein said electrodes are relatively displaced along a programmed path of a predetermined shape and the machining gap between the electrodes is adjusted as a function of the machining conditions, the improvement comprising varying the speed of rela-

tive displacement of the electrodes as a function of the shape of said path such as to maintain constant the distance between the





longitudinal axis of the wire electrode and one of the surfaces of the workpiece electrode.

4,081,653

REMOVAL OF THIN FILMS FROM SUBSTRATES BY LASER INDUCED EXPLOSION

Jackson Chik-Yun Koo, Sau Paulo, Brazil, and Vincent Joseph Zaleckas, Union, N.J., assignors to Western Electric Co., Inc., New York, N.Y.

Filed Dec. 27, 1976, Ser. No. 754,293
Int. Cl.[2] B23K *26/00;* **B05D** *3/06*
U.S. Cl. 219—121 LM **10 Claims**

1. A method for the removal of a metallic thin film coating from a substrate, comprising the steps of:

directing a beam of radiant energy to heat the thin film coating to a temperature below the melting temperature of the coating material and above the vaporization temperature of the substrate to heat and cause vaporization of the substrate at the thin film-substrate interface; and

entrapping the vapors at said interface to induce an explosion to remove the thin film coating from the substrate.

2. The method as set forth in claim 1, wherein:

the beam of radiant energy is a laser beam.

4,081,654

METHODS AND APPARATUS FOR SELECTIVELY REMOVING A METALLIC FILM FROM A METALLIZED SUBSTRATE

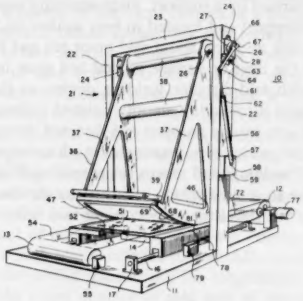
Jaroslav Mracek, Lawrence Township, Mercer County, N.J., assignor to Western Electric Co., Inc., New York, N.Y.

Filed Dec. 27, 1976, Ser. No. 754,294
Int. Cl.[2] B23K *9/00*
U.S. Cl. 219—121 LM **8 Claims**

1. A method of selectively removing metal from a metallized substrate with a laser beam, comprising the steps of:

flexing the metallized substrate to form a segment of a right circular cylinder;

positioning an apertured planar mask in a plane which is in spaced tangential relation to the flexed substrate; and



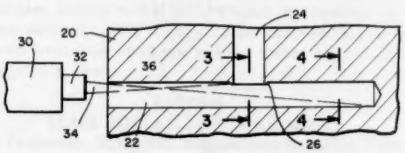
scanning the laser beam, through the apertured mask, along a line on the surface of the flexed substrate formed by the intersection of a plane parallel to the mask and tangential to the flexed metallized substrate, to selectively remove the metal from the substrate.

4,081,655

METHOD OF DEBURRING INTERSECTING DRILLED HOLES

Preston Lee Gale, East Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Aug. 22, 1975, Ser. No. 607,075
Int. Cl.[2] B23K *26/00*
U.S. Cl. 219—121 LM **5 Claims**



1. In the method of providing a drilled hole in a metal part intersecting a passageway previously formed in the metal part and extending along an axis from an opening to the outside thereof, removing the burr produced at the intersection by the steps of:

a. producing a high power beam of coherent electromagnetic energy:

b. focusing said high power beam of coherent electromagnetic energy to a maximum cross-sectional diameter in the focal plane thereof smaller than the minimum cross-sectional dimension of said passageway;

c. positioning the focal plane of said focused beam substantially normal to said axis of said passageway between the source of said focused beam and said burr;

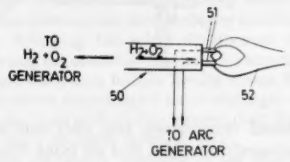
d. locating the focal plane of said beam with respect to said opening of said passageway so that all of said beam enters said passageway; and

e. positioning the axis of said beam with respect to said axis of said passageway so that a peripheral portion only of said beam downstream from said focal plane impinges said burr at the junction of said drilled hole with said passageway.

4,081,656
ARC-ASSISTED OXY/HYDROGEN WELDING

Yull Brown, 182 Auburn Rd., Auburn, New South Wales, Australia

Division of Ser. No. 489,921, Jul. 19, 1974, Pat. No. 4,014,777.
This application Sep. 10, 1976, Ser. No. 722,125
Claims priority, application Australia, Jul. 20, 1973, PB4159; Aug. 3, 1973, PB4341; May 2, 1974, PB7418
Int. Cl.² B23K *17/00*; C25B *15/02, 1/04*
U.S. Cl. 219—137.31 17 Claims

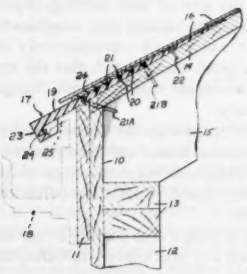


1. A method of oxy/hydrogen welding, brazing or the like, characterized by electrolytically generating a mixture of hydrogen and oxygen in substantially stoichiometric proportions by passing an electric current between electrodes immersed in an aqueous electrolyte contained in at least one electrolytic chamber, passing the mixture of hydrogen and oxygen from said at least one chamber through an aqueous electrolyte contained in a pressure sensitive regulating device having at least one pair of electrodes connected electrically in series with said electrodes in said at least one electrolytic chamber, which electrolyte in said regulating device is displaceable as a result of pressure of said mixture of hydrogen and oxygen to proportionately increase the electrolyte resistance between said pair of electrodes and consequently reduce the electric current passing between said pair of electrodes in said regulating device and said electrodes in said at least one electrolytic chamber in accordance with an increase in pressure therein, passing said gaseous mixture through falshback arresting means and thence through a burner nozzle, producing an arc between electrodes arranged downstream of said burner nozzle and in the path of said gases so as to produce dissociation of said gases into atomic hydrogen and atomic oxygen, and burning said hydrogen and oxygen to produce a flame, the temperature of the flame exceeding the normal temperature of combustion of molecular hydrogen and oxygen.

4,081,657
ELECTRICALLY HEATED ROOF DRIP EDGE STRIP

George H. Stanford, 191 Spurwink Rd., Scarborough, Me. 04074

Filed Oct. 6, 1976, Ser. No. 730,150
Int. Cl.² H05B *1/00*
U.S. Cl. 219—213 5 Claims

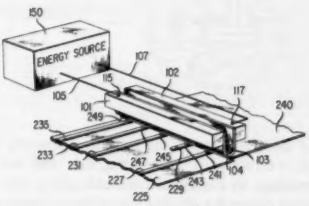


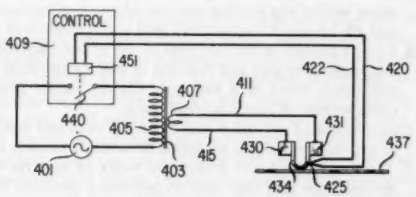
1. A tapered drip edge strip for a shingled roof, said strip including a first layer to be secured to the roof and so dimensioned that a major transverse portion will underlie the first course of shingles, said major portion to be nailed to the roof through the upper part thereof, and a minor transverse portion will be exposed beyond the butt ends of the shingles thereof, said first layer a relatively thick plastic extrusion that is a poor thermal conductor, said first layer tapered with the lower edge the thicker edge, and a relatively thin second layer dimensioned to underlie said first course and to overlie said major portion of said first layer and sealable thereto, and one of said layers having a series of parallel channels located to closed by the other layer, each channel dimensioned to accommodate a heating cable course, said series spaced relative to the upper and lower edges of said major portion to enable the two layers to be sealed together, at least on the lower side of said series to secure the second layer to the attached first layer.

4,081,658
ELECTRICALLY HEATED SOLDERING DEVICE

Hans Hugo Ammann, Chester, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Division of Ser. No. 553,521, Feb. 27, 1975, Pat. No. 3,991,247.
This application Apr. 28, 1976, Ser. No. 681,264
Int. Cl.² H05B *3/00*; B23K *3/02*
U.S. Cl. 219—233 2 Claims





1. A device for heating a plurality of linearly spaced elements comprising first and second electrically and thermally conductive elongated rectangular cross section bars; a rigid, relatively lower conductivity, elongated metallic strip holding said first and second bars in spaced, substantially parallel relation comprising a first vertical side joined all along its length to one elongated side of said first rectangular cross section bar, a second vertical side joined all along its length to one elongated side of said second rectangular cross section bar and an arcuate lower portion joining said first and second vertical sides and protruding from said bars for simultaneously contacting said plurality of linearly spaced elements along its elongated dimension, an electrical current source, and means for applying electrical current from said source to said bars comprising a first electrical connection at one end of said first rectangular cross section bar and a second electrical connection to the opposite end of said second rectangular cross section bar, said bars and said rigid metallic strip forming an electrical current path transverse to the elongated dimension of said rigid metallic strip to uniformly heat the elongated contact area of said arcuate lower portion, each of said bars comprising a relatively massive bar with respect to said metallic strip for rapidly cool-

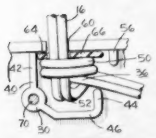
ing said metallic strip on discontinuance of said electrical current.

4,081,659

COFFEEMAKER WITH ELECTRICAL CORD STRAIN RELIEF

Charles L. Kemp, Asheboro, N.C., assignor to General Electric Company, Bridgeport, Conn.

Filed Nov. 12, 1976, Ser. No. 742,531
Int. Cl.² H05B 1/00; H01R 13/58
U.S. Cl. 219—296 **7 Claims**



1. In an electrical appliance having a housing including an upper wall, a downwardly extending side wall and an enlarged bottom opening, an electrical cord extending into the housing, and a bottom cover for closing the enlarged bottom opening in the housing the improvement comprising:

a. a downwardly extending rib integrally formed with the upper wall of the housing and the side wall of the housing, said rib having a longitudinal wall and a transverse wall;

b. a notch formed in the side wall of the housing adjacent to said transverse wall and opposite to said longitudinal wall, said notch being of a size only slightly larger than the cross section of said electrical cord;

c. an overhand knot tied in said electrical cord and tightened to provide two bights arranged at an angle to each other;

d. the longitudinal and transverse walls of said rib being spaced from said side wall to provide a partition that is just large enough to receive said knot with one bight extending generally parallel to said side wall and the other bight extending toward said longitudinal wall; and

e. said bottom cover including two upwardly extending fingers integrally formed therewith, said fingers being arranged to straddle the notch in the side wall of said housing and the electrical cord that extends therethrough so that in the event of any strain on the cord tending to pull it out of the housing the knot that is tied in the cord will abut the two fingers that are formed in the bottom cover to distribute the force between both the housing and the bottom cover and to confine the cord within the housing.

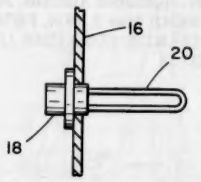
4,081,660

HEATER SHUTDOWN CIRCUIT

Michael B. Uffer, Baltimore, and Clarence Wang, Silver Spring, both of Md., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Jul. 6, 1976, Ser. No. 702,650
Int. Cl.² H05B 1/02
U.S. Cl. 219—504 **18 Claims**

1. An electric heater shutdown circuit connectible between an electric current source and a heating element in an electric heater and comprising electronic means for shutting off electric current to the heating element when the heating element reaches a predetermined temperature, and electronic means for maintaining the flow of electric current to the heating element shut off after the heating element cools to a temperature below



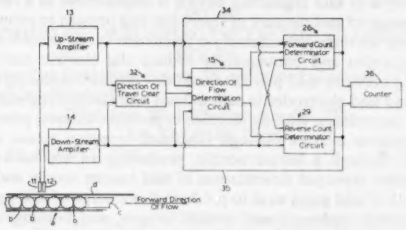
said predetermined temperature, said electronic means for maintaining said electric current shut off being disabled only upon disconnection of said shutdown circuit from the current source for a predetermined period of time.

4,081,661

FLOW LINE COUNTER INCORPORATING PROGRAMMED REVERSAL CIRCUITRY

John R. Durbin, 2014 Green Glen Dr., Apt. 102, Kirkwood, Mo. 63122

Filed Sep. 13, 1976, Ser. No. 722,384
Int. Cl.² G06M 7/00, 3/14
U.S. Cl. 235—92 EV **6 Claims**



1. A system for counting similar-sized objects moving along a line of flow without counting the vibrations of such objects, comprising

upstream sensor means to detect either the presence or absence of an object as it passes along the line of flow, and means operably associated therewith to produce signals reflecting such presence or absence,

a downstream sensor similar to said upstream sensor and similar signal producing means associated therewith,

said sensors being positioned along a line of flow at a spacing relative to the size of such moving objects sufficiently short that said two sensors may simultaneously sense the same object and cannot simultaneously sense different objects, and great enough such that the upstream sensor and the downstream sensor cannot change their signals simultaneously,

a logic subsystem having the inputs responsive to signals from the upstream sensor and the downstream sensor, said logic subsystem including means to provide consecutively during uninterrupted vibration-free flow along such production lines:

a neutral state in which both sensors do not detect an object and by which any previously established directional state is neutralized,

a select up-count direction state reflecting the condition that the upstream sensor detects an object and the downstream sensor does not,

a confirm up-count direction state, initiable only immedi-

ately following the select up-count direction state, reflecting the conditon that both sensors detect an object, and

a select down-count direction state reflecting the condition that the downstream sensor detects an object and the upstream sensor does not;

said logic subsystem further having means for producing a count-up output signal attendant to the state change from said confirm up-count direction state to said select down-count direction state,

whereafter, on continued forward uninterrupted vibration-free flow, the neutral state again follows said select down-count direction state,

said logic subsystem further having means to provide a confirm down-count direction state initiable only immediately following the select down-count direction state, reflecting the condition that both sensors detect an object,

said logic subsystem further having means for producing a count-down output signal when said logic subsystem state changes from said confirm down-count direction state to said select up-count direction state,

said logic subsystem operating in the following sequence upon a reverse direction flow along the line of flow: said neutral state, said select down-count direction state, said confirm down-count direction state, said select up-count direction state, finally returning to said neutral state,

whereby, the logic subsystem corrects the count for large movements opposite to the normal direction of flow and permits count of reversed flow,

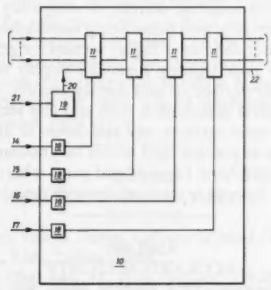
counter means, and

means for incrementing the count of the counter means upon reception of a count-up output signal from the logic subsystem and means for decrementing such count upon reception of a count-down output signal therefrom.

4,081,662
CLOCK SUPERVISION IN DIGITAL SYSTEMS

Jens Erland Pehrson, Sollentuna; Sture Gösta Roos, Bergshamra, and Bartolo Valastro, Skarholmen, all of Sweden, assignors to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed Mar. 28, 1978, Ser. No. 722,673
Claims priority, application Australia, Sep. 29, 1975, 3364/75
Int. Cl.[2] G06F *11/00*
U.S. Cl. 235—308 **5 Claims**

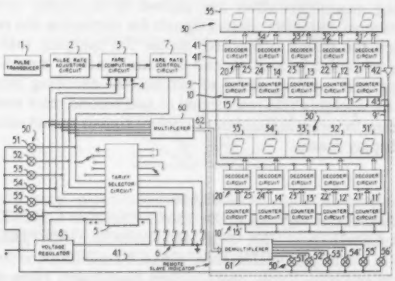


1. A method for the supervision of clock signals in a digital data system having registers through which data is progressively clocked by such clock signals, said method comprising the steps of providing a supervising flip-flop for each one of the registers and arranging said flip-flops to form a supervision chain, generating at least one clock supervision bit, supplying said clock supervision bit to the first flip-flop in the supervision chain so as to change the binary condition of said first flip-flop, supplying a unit of binary information concerning the state of each flip-flop in the supervision chain to the subsequent flip-flop of the supervision chain, changing the binary state of each flip-flop in dependence of the binary-state-change information from the previous flip-flop in the supervision chain, and monitoring the binary condition of the last flip-flop of the supervision chain so as to determine whether said clock supervision bit has propagated through the whole supervision chain of flip-flops which occurs when all clock signals have been supplied correctly to each of the registers because the absence of one or more clock signals prevents said clock supervision bit from propagating through the supervision chain.

4,081,663
ELECTRONIC TAXIMETER HAVING MASTER-REMOTE SLAVE TARIFF AND FARE DISPLAYS

Erik Jan Krister Ahlberg, Halmstad, Sweden, assignor to Haldex Aktiebolag, Sweden

Filed Jan. 21, 1977, Ser. No. 760,983
Int. Cl.[2] G07B *13/10*
U.S. Cl. 364—467 **12 Claims**



1. In an electronic taximeter of the type including fare computing means responsive to tariff control signals for developing a sequence of pulses at a repetition rate representative of an accrual rate at which the fare computed according to the particular tariff represented by said tariff control signals accrues, and tariff selecting means operable for selecting the tariff control signals representing the tariff at which the fare is being computed thereby to change the pulse repetition rate of said sequence of pulses; the improvement which comprises: a master-remote slave display pair for displaying the tariff at which the fare is being computed and for displaying the accrued fare as it continually accrues, the master display comprising counting means operable to continually count said sequence of pulses for developing a cumulative pulse count continually representative of an accrued fare represented by a number of said pulses developed, said counting means including resetting means responsive to a reset signal for resetting said counting means to clear the cumulative pulse count stored therein; fare display means for displaying an accrued fare represented by the cumulative pulse count stored in said counting means; decoding means connected to receive the cumulative pulse count stored in said counting means for continually decoding the cumulative pulse count and connected to said display means to apply the decoded pulse count to said fare display means for driving the same to display the accrued fare represented by the cumulative pulse count, said decoding means being normally inoperative and including enabling means responsive to an enabling signal for rendering said decoding means operative; reset signal generating means normally developing a reset signal and applying the same to said resetting means for resetting said counting means and being rendered inoperative by and connected to receive said enabling signal for terminating the reset signal thereby to render said counting means operative to count said sequence of pulses

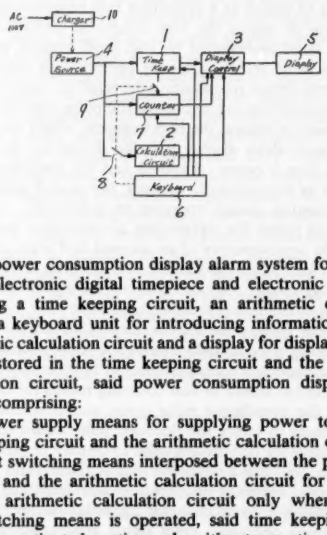
upon the occurence of said enabling signal; and tariff display means receptive of said tariff control signals for displaying the tariff at which the fare is computed; the remote slave display being located remote from said master display and comprising second counting means operable to continually count said sequence of pulses for developing a cumulative pulse count continually representative of the accrued fare represented by the number of pulses developed, said second counting means including second resetting means responsive to said reset signal for resetting said second counting means; second fare display means for displaying the accrued fare represented by the cumulative pulse count stored in said second counting means; second decoding means connected to receive the cumulative pulse count stored in said second counting means for continually decoding this cumulative pulse count and connected to said second display means to apply the decoded pulse count to said second display means for driving the same to display the accrued fare represented by the cumulative pulse count stored in said second counting means, said second decoding means being normally inoperative and including enabling means responsive to said enabling signal for rendering said second decoding means operative; and second tariff display means responsive to said tariff control signals for displaying the tariff at which the fare is computed; means for applying said sequence of pulses to said second counting means; means for applying said enabling signal to said second decoding means; means for applying said reset signal to said second reset means; and means for applying said tariff control signals to said second tariff display means.

4,081,664

CALCULATOR OPERATION TIME PERIOD COUNTER IN A COMBINATION OF ELECTRONIC TIMEPIECE AND ELECTRONIC CALCULATOR

Isamu Washizuka, Kyoto, and Shintaro Hashimoto, Nara, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Apr. 9, 1976, Ser. No. 675,595
Claims priority, application Japan, Apr. 11, 1975, 50-49923
Int. Cl.[2] G06F *7/38, 15/02;* G04B *37/12*
U.S. Cl. 364—705 **5 Claims**



1. A power consumption display alarm system for a combination electronic digital timepiece and electronic calculator including a time keeping circuit, an arithmetic calculation circuit, a keyboard unit for introducing information into the arithmetic calculation circuit and a display for displaying information stored in the time keeping circuit and the arithmetic calculation circuit, said power consumption display alarm system comprising:

a. power supply means for supplying power to the time keeping circuit and the arithmetic calculation circuit;

b. first switching means interposed between the power supply and the arithmetic calculation circuit for activating the arithmetic calculation circuit only when the first switching means is operated, said time keeping circuit being activated continuously without operation of the first switching means;

c. a calculator operation time period counter means for counting a time period in response to actuation of the first switching means;

d. second switching means adapted to be operated only when said first switching means is operated, and interposed between the time keeping circuit and the calculation operation time period counter means, thereby introducing a clock signal from the time keeping circuit into the calculator operation time period counter only when the first switching means and the second switching means are operated; and

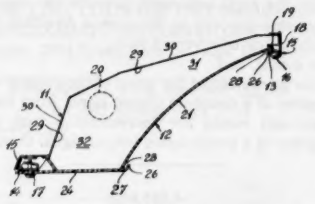
e. power consumption display means contained in said display and connected to the calculator operation time period counter means for displaying information stored within the calculator operation time period counter means, thereby displaying power consumption in said combination electronic digital timepiece and electrical calculator.

4,081,665

LIGHTING FIXTURE FOR PASSENGER VEHICLES

Paul Corbeil, Laval, Canada, assignor to Peerless Electric Ltd., Montreal, Canada

Filed Sep. 23, 1976, Ser. No. 725,945
Int. Cl.[2] B60Q *1/00;* B06Q *3/00;* B60Q *11/00;* G09F *13/00*
U.S. Cl. 362—223 **8 Claims**



1. A lighting fixture comprising a housing, a light source within said housing, a light transmitting panel hinged directly to said housing, said panel having opposed longitudinal edges, one of said edges being integrally formed with a hinge flange to hingeably engage within a channel member formed in an upper peripheral edge of said housing, said hinge flange being constituted by a marginal edge portion of said one longitudinal edge being inwardly turned in the direction of an outer surface of said panel to form a hook flange, the other of said edges having fasteners directly attached thereto to removably secure said panel to said housing, said panel being constructed of translucent material and defining a display section for general illumination and for back lighting sheet-like display material held against an outer surface of said display section, and a lower section for general illumination, both said lens sections having flat inner and outer surfaces, and seal means in direct contact with said panel to prevent light within said housing from leaking along the peripheral edges of said panel whereby all of the light from the housing is directed through the panel.

4,081,666

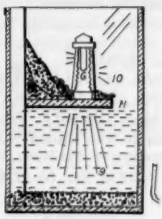
ECOLARIUM LIGHTS

Otto Adolf Roehrick, 1333 Elkhorn Blvd., Rio Linda, Calif. 95673

Filed Mar. 1, 1976, Ser. No. 662,809
Int. Cl.[2] F21P *1/02*
U.S. Cl. 362—253 **5 Claims**

1. The combination of an ornamental lighting device and a display comprising a transparent shelf, at least one ornamental sculpture seated on said shelf, said sculpture including a transparent base member in contact with said shelf, non-transparent side and top members, at least one transparent aperture in said non-transparent members and means for illumination contained within said sculpture, said at least one sculpture being surrounded on said shelf with means for simulation of a land environment, and means below said shelf for simulation of

water environment whereby said at least one transparent aperture and said transparent base permits said means for illumination to illuminate both said simulated land and water environments.

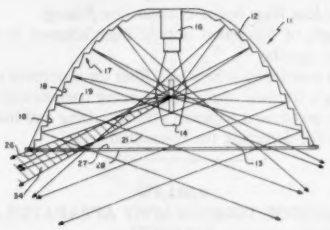


4,081,667

LIGHTING FIXTURE HAVING FRESNEL REFLECTOR WITH HIGH REFLECTION COATING THEREON

Ian Lewin, Scottsdale, Ariz., and Edward S. Small, Jr., Santa Rosa, Calif., assignors to Optical Coating Laboratory, Inc., Santa Rosa, Calif.

Filed Jul. 28, 1976, Ser. No. 708,859
Int. Cl.² F21V *7/09, 7/00*
U.S. Cl. 362—296 **12 Claims**



1. In a lighting fixture, a housing having an open side, a lamp mounted in the housing and producing light rays passing through the open side, an internal reflecting surface carried by the housing for reflecting light rays from the lamp through the open side, said internal reflecting surface including Fresnel type portions positioned so that there is provided a Fresnel type of reflector for reflecting light rays at higher angles of 70° or greater through the open side of the housing by a single reflection of each light ray.

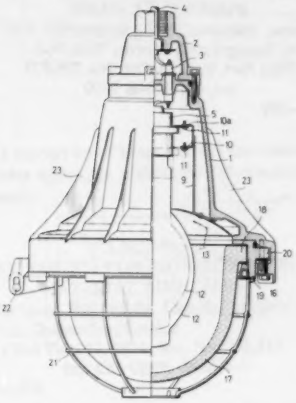
4,081,668

SOCKET-MOUNTING APPARATUS FOR LIGHTING DEVICES

Shinjiro Mori, Tokyo, Japan, assignor to Mori Denki Manufacturing Co., Ltd., Tokyo, Japan

Filed Aug. 31, 1976, Ser. No. 719,387
Claims priority, application Japan, Mar. 26, 1976, 51/37188[U]
Int. Cl.² F21V *19/02*
U.S. Cl. 362--296 **3 Claims**

1. A socket mounting apparatus for lighting devices comprising a plurality of socket-fixing clamps and a socket-fixing plate which has a circular opening in the center thereof such that a light bulb socket may be inserted into said opening, each of said socket-fixing clamps having located at one end thereof a mounting member to affix the clamps to a lighting device and at the other end a plurality of mounting legs which project at right angles to the direction of the clamp and which are spaced apart from each other at different heights along the length of the clamp and wherein each of the mounting legs is provided with a small screw; said socket-fixing plate containing projections extending from the periphery thereof in a number corresponding to the total number of socket-fixing clamps, said projections each containing U-cuts which are formed at right angles in respect to the length of the projections, said mounting legs being affixed to the socket-fixing plate by engaging the small screws located in the mounting legs with the U-cut openings, each of said socket-fixing clamps further containing



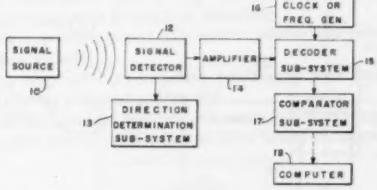
a reflecting plate-mounting member located between the mounting members and the mounting legs thereof and a reflecting plate mounted onto said reflecting plate-mounting member and wherein the socket-mounting apparatus is such as to permit a lighting device in which it is mounted to accommodate the structure of different size light bulbs by affixing the socket-fixing plates at different heights along the socket-fixing clamps by means of the various mounting legs.

4,081,669

RECOGNITION SYSTEM FOR CLASS II ROBOTS

Edwin E. Klingman, III, 950 N. San Antonio Rd., Apt. 6B, Los Altos, Calif. 94022

Continuation-in-part of Ser. No. 409,989, Oct. 26, 1973. This application Feb. 20, 1976, Ser. No. 659,829
Int. Cl.² H04B *9/00*
U.S. Cl. 250—199 **10 Claims**



1. A system for enabling a Class II robot to recognize, identify and locate individula ones of plurality of objects in an environment comprising:

(a) a transmitter physically adjacent each object for transmitting a coded signal that is unique for each object enabling it to be identified;

(b) a receiver in the vicinity of the objects;

(c) decoding means at the receiver responsive to a coded signal from an object for decoding the signal and identifying the object; and

(d) locating means at the receiver responsive to the spatial position of the transmitter relative to the receiver for

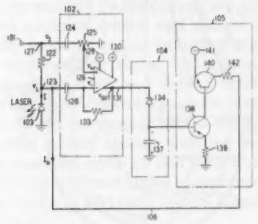
receiving the same coded signal as the decoding means and determining therefrom the position of the object with respect to the receiver.

7. A system according to claim 1 wherein the coded signal is a light signal.

4,081,670
AUTOMATIC BIAS CONTROL CIRCUIT FOR INJECTION LASERS

Andres Albanese, Matawan, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 8, 1976, Ser. No. 739,575
Int. Cl.[2] H04B 9/00
U.S. Cl. 250—199 8 Claims



1. An automatic bias control circuit for an injection laser which laser current is modulated in response to a modulating signal comprising:

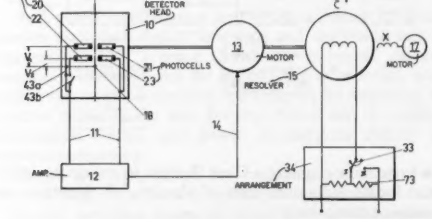
means for deriving an error voltage directly from changes in the junction voltage of the laser generated in response to the modulated current through said laser; and

means for adjusting the laser bias current in response to said error voltage so that the modulated laser current remains above the threshold level of the laser.

4,081,671
PHOTOELECTRIC LINE FOLLOWER

Dietrich Böhme, Kahl (Main); Günter Hellmut Schumann, Ober-Roden; Günter Hahn, Hausen, and Rolf Jung, Waiblingen, all of Germany, assignors to Messer Griesheim GmbH, Frankfurt am Main, Germany

Filed Aug. 5, 1976, Ser. No. 711,844
Claims priority, application Germany, Aug. 2, 1975, 2534589
Int. Cl.[2] G05B 1/00
U.S. Cl. 250—202 4 Claims

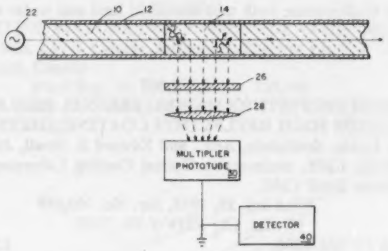


1. In an arrangement for cutting workpieces with a scanning device which includes a signalling photo-detector for detecting markings and with an attached control device which contains a first timing element to which is connected a switch for switching to a reduced rate of feed, the improvement being an OR-element connected between said first timing element and said switch, a further timing element being connected by means of an AND-element to the input and the output of said first timing element, the input of said further timing element being connected to the output of said AND-element, and the output of said further timing element being operationally connected to an input of said OR-element.

4,081,672
LOW-LOSS SIGNAL COUPLER FOR OPTICAL COMMUNICATIONS AND INTEGRATED OPTICS

Hubert H. Caspers, La Mesa; Howard E. Rast Jr., Salana Beach, both of Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 4, 1976, Ser. No. 729,052
Int. Cl.[2] G02B 5/16
U.S. Cl. 250—227 9 Claims



1. A low-loss fiber optics coupler comprising:

a. a length of fabricated optical fiber adapted to transmit optical signals;

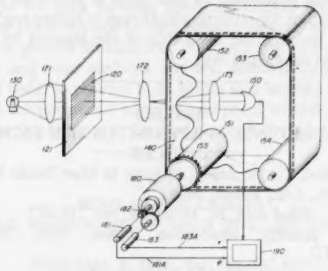
b. means positioned within said fiber for absorbing and fluoriscing a fraction of the signal being transmitted;

c. means positioned adjacent said absorbing and fluorescing means for detecting the re-emitted signal.

4,081,673
TRANSVERSE TOMOGRAPHY APPARATUS AND METHOD

William Swindell, and Harrison H. Barrett, both of Tucson, Ariz., assignors to University Patents, Inc., Stamford, Conn.

Filed Apr. 12, 1976, Ser. No. 675,960
Int. Cl.[2] H01J 39/12
U.S. Cl. 250—237 R 27 Claims



1. Apparatus for generating a two-dimensional back-projected image of a slice of an object, comprising:

photodetector means;

illuminating means directed toward said photodetector means;

carrier means disposed between said illuminating means and said photodetector means, said carrier means having a plurality of substantially parallel elongated projections on the surface thereof, each projection having an optical characteristic representing the density characteristic of

said slice of the object as measured at a particular relative rotational angle;

mask means also disposed between said illuminating means and said photodetector means, said mask means comprising a plurality of cycles of a substantially sinusoidally shaped pattern of varying amplitude;

means for moving said carrier means and said mask means with respect to each other; and

display means responsive to the output of said photodetector means for displaying the back-projected image.

4,081,674

ION MICROPROBE ANALYZER

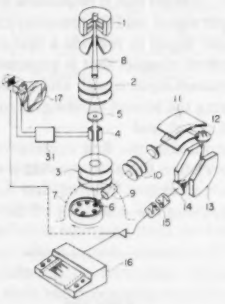
Hifumi Tamura, Hachioji; Tohru Ishitani, Sayama, and Tokuro Hirano, Katsuta, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Dec. 20, 1976, Ser. No. 751,986

Claims priority, application Japan, Jan. 21, 1976, 51-4928; May 21, 1976, 51-57806

Int. Cl.[2] G01M *27/78, 23/00*

U.S. Cl. 250—251 20 Claims



1. In an ion microprobe analyzer wherein a specimen is irradiated by a primary ion beam derived from an ion source and projected along an optical axis by a primary ion focusing system, and wherein secondary ions generated from the specimen are analyzed, the improvement comprising ion beam deflecting means disposed between said ion source and said specimen, including:

a. an aperture which is movable between a position on the ion beam optical axis and a position deviating from said optical axis;

b. first deflector means for deflecting said ion beam towards the point where the aperture is situated when at the deviating position; and

c. second deflector means for deflecting forwards along said ion beam optical axis the ion beam which passes through said aperture situated at said deviating position.

4,081,675

GEOPHYSICAL AND GEOCHEMICAL EXPLORATION

Gerald L. Bartz, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 8, 1976, Ser. No. 739,764

Int. Cl.[2] G01V *5/00*

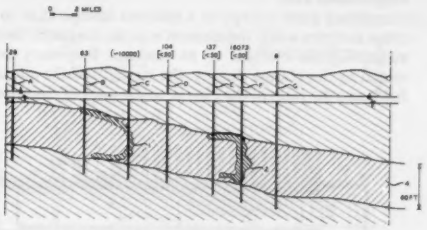
U.S. Cl. 250—255 6 Claims

1. A process for prospecting for uranium deposits comprising

a. drilling a first set of holes into a formation,

b. procuring at least one sample of drill cuttings from the formation from each hole,

c. determining the Po-210 content of each of these samples, and thereafter



d. drilling a second set of holes into the formation downdip of the holes where the highest Po-210 concentration has been found.

4,081,676

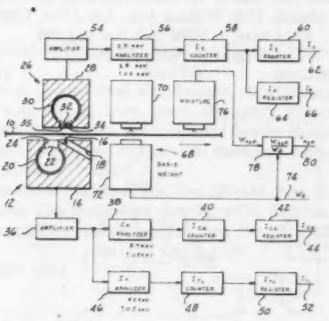
ON-LINE SYSTEM FOR MONITORING SHEET MATERIAL ADDITIVES

Alexander Buchnea, Willowdale, Canada, assignor to Sentrol Systems Ltd., Downsview, Canada

Filed Dec. 17, 1976, Ser. No. 751,312

Int. Cl.[2] G01N *23/20*

U.S. Cl. 250—272 19 Claims



1. Apparatus for measuring the contents of a first additive in a sheet material containing a second additive exhibiting high-energy X-ray fluorescence, said apparatus comprising:

means for irradiating the sheet material with X-ray radiation of a sufficiently high energy level to cause said second additive to emit fluorescent radiation;

means responsive to said fluorescent radiation for providing a first signal;

means responsive to radiation penetrating said sheet for providing a second signal; and

means responsive to said first and second signals for computing the content of said first additive in said sheet material.

4,081,677

ISOTOPE SEPARATION BY MAGNETIC FIELDS

John Myrick Dawson, Pacific Palisades, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Division of Ser. No. 562,993, Mar. 27, 1975. This application Feb. 17, 1976, Ser. No. 658,567

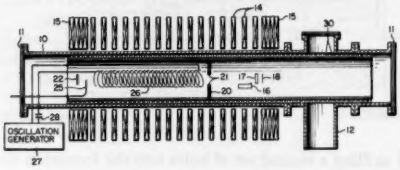
Int. Cl.[2] H01J *39/34*

U.S. Cl. 250—290 10 Claims

1. The method of separating one isotope of an element from the others which comprises the steps of:

(a) generating a dense, substantially electrically neutral plasma including an element having at least two ionized isotopes to be separated;

(b) generating a substantially steady magnetic field extending through the plasma and substantially parallel to a longitudinal axis;
(c) imparting more energy to a selected isotope than to the other isotopes while the element is in the magnetic field by subjecting the element to its resonant frequency determined by the plasma density, the strength of the magnetic field, and the ratio of the charge to the mass of the selected



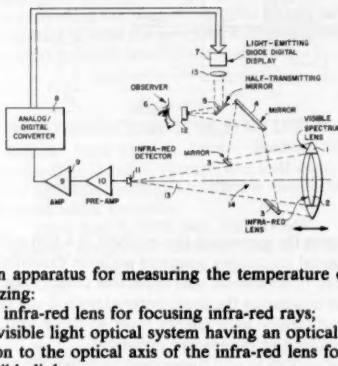
isotope, the plasma being large enough to encompass the orbital paths of the isotopes;
(d) generating a second steady magnetic field; and
(e) separating the isotopes from each other on the basis of their differential energies by causing the isotopes which have received different energies to diffuse across the second magnetic field, whereby the isotopes having different energies will diffuse at different rates.

4,081,678

THROUGH-THE-LENS THERMOMETER APPARATUS

Thomas F. Macall, 1720 Witham Ave., Los Altos, Calif. 94022

Filed Mar. 1, 1976, Ser. No. 662,356
Int. Cl.² H01J *31/49*
U.S. Cl. 250—330 **14 Claims**



1. An apparatus for measuring the temperature of objects, comprizing:
a. an infra-red lens for focusing infra-red rays;
b. a visible light optical system having an optical axis common to the optical axis of the infra-red lens for focusing visible light;
c. an infra-red detector located proximate the focal point of the infra-red lens, having an output;
d. an amplifier responsive to the output of the infra-red detector;
e. a display responsive to the amplifier output for displaying the magnitude of the amplifier output.

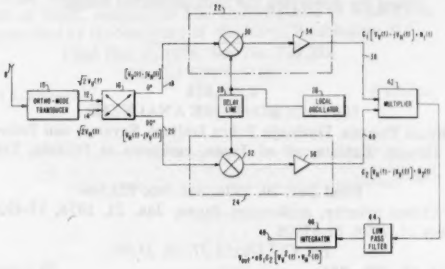
4,081,679

DUAL CHANNEL CORRELATION RADIOMETER

Marvin Cohn, Baltimore, Md., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 17, 1977, Ser. No. 778,753
Int. Cl.² G01J *1/00*
U.S. Cl. 250—338 **12 Claims**

1. A radiometer that is responsive to first and second thermal signals from first and second mutually independent energy sources respectively, said radiometer comprising:
means for combining the first and second thermal signals to form first and second receiver channel input signals having components that are correlated with respect to each other, the second thermal signal included in said first receiver channel input signal being in phase quadrature with respect to the second thermal signal included in said second receiver channel input signal, and the first thermal signal included in said second receiver channel input signal being in phase quadrature with respect to the first thermal signal included in said first receiver channel input signal;



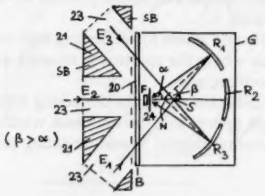
a first receiver channel that is responsive to the first receiver channel input signal, said first receiver channel amplifying the first input signal to provide a first correlation signal;
a second receiver channel that is responsive to the second receiver channel input signal, said second receiver channel amplifying the second input signal to provide a second correlation signal; and
means for correlating the first correlation signal with the second correlation signal to provide a radiometer output signal, the correlation of first and second correlation signals improving the sensitivity of the radiometer.

4,081,680

INFRARED RADIATION-BURGLARY DETECTOR

Hansjürg Keller, Mannedorf, Switzerland, assignor to Cerberus AG, Mannedorf, Switzerland

Filed Nov. 4, 1976, Ser. No. 738,909
Claims priority, application Switzerland, Jun. 21, 1976, 7795/76
Int. Cl.² G08B *13/18*; G01J *1/02*
U.S. Cl. 250—342 **24 Claims**

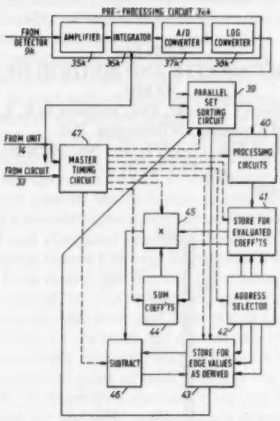


1. An infrared radiation-burglary detector comprising a common radiation receiver for different receiving regions, a number of reflector surfaces focusing the radiation arriving from the different receiving regions upon the common radiation receiver, said reflector surfaces being arranged and aligned such that any intersection locations of the receiving regions, viewed in the irradiation direction, are located behind the front of the detector, so that there is prevented focusing of radiation upon said common radiation receiver from an object disposed at any location in front of the detector by more than one of said reflector surfaces.

4,081,681
TREATMENT OF ABSORPTION ERRORS IN COMPUTERIZED TOMOGRAPHY

Robert Justin Froggatt, Southall, England, assignor to EMI Limited, Hayes, England

Filed Dec. 30, 1976, Ser. No. 755,629
Claims priority, application United Kingdom, Jan. 15, 1976, 1497/76
Int. Cl.[2] A61B *6/02*; G01N *23/08*; H05G *1/30*
U.S. Cl. 250—360 **13 Claims**



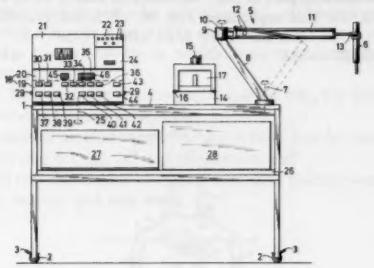
1. Radiographic apparatus including a source of penetrating radiation such as X-radiation, arranged to project radiation through a cross-sectional slice of a body, detector means disposed to receive radiation emergent from the body, said detector means providing output signals indicative of the absorption suffered by said radiation on traversing substantially linear paths through said slice, and processing means for operating on said output signals to evaluate absorption coefficients for a plurality of elemental areas distributed over said slice, said processing means including compensating means for adjusting said so evaluated absorption coefficients to compensate for the detection, by said detector means, of scattered radiation.

4,081,682
LOCATING AND IDENTIFYING A RADIOACTIVE URANIUM AND/OR TRANSURANIUM ISOTOPE DEPOSITED IN A WOUND

Lothar Ohlenschlager, Eggenstein-Leopoldshäfen; Olaf Fromhein, Bruchsal, and Wilhelm Rapp, Eggenstein-Leopoldshafen, all of Germany, assignors to Gesellschaft fur Kernforschung m.b.H., Karlsruhe, Germany

Filed Dec. 6, 1976, Ser. No. 747,684
Claims priority, application Germany, Dec. 5, 1975, 2554668
Int. Cl.[2] G01T *1/20*
U.S. Cl. 250—362 **13 Claims**

1. A method for accurately locating and roughly identifying a radioactive uranium or transuranium isotope deposited in a wound, comprising the steps of: monitoring alpha radiation in the edge region of the wound and at the wound surface to determine whether surface contamination is present; monitoring low-energy X-ray or gamma radiation at the wound to determine the presence of a low-energy X-ray or gamma radiation source; measuring the low-energy X-ray or gamma radiation in the wound by means of a succession of detectors having progressively increasing local resolution and decreasing limitation of the defectable volume to effect coarse and then fine localization of even small uranium or transuranium isotope deposits in a wound; displaying the measuring result produced by at least one of the detectors as a pulse amplitude spectrum; and comparing the displayed result, in order to roughly identify the isotope of the radioactive deposit enclosed in the

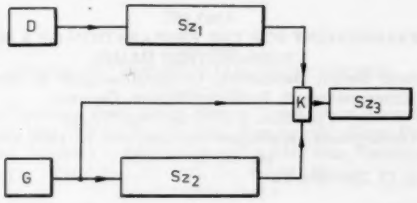


wound, with subsequently measured spectra of predetermined isotopes.

4,081,683
MEASURING THE CONCENTRATION OF BORON IN WATER

Gyula Csom; Sandor Desi; Eva Szolnay, all of Budapest; Csaba Gyurkocza, Etyek; Imre Szucs, Budapest; Vilmos Varbiro, Budapest; Sandor Elo, Budapest, and Sandor Benedek, Budapest, all of Hungary, assignors to Budapesti Muszaki Egyetem, Budapest, Hungary

Continuation-in-part of Ser. No. 520,143, Nov. 1, 1974, abandoned. This application Sep. 20, 1976, Ser. No. 724,841
Claims priority, application Hungary, Nov. 5, 1973, BU 697
Int. Cl.[2] G01T *1/20*
U.S. Cl. 250—364 **1 Claim**



1. Method for the determination of the concentration of boron in water, comprising establishing a measuring vessel bounded on opposite sides by flat surfaces that are parallel to each other, introducing into said vessel between said surfaces an aqueous solution containing boron, establishing a radioactive neutron source on one side of said vessel in a neutron moderator, positioning a neutron detector in a neutron reflector on the other side of said vessel from said neutron source, the path between said source and detector being perpendicular to said surfaces, measuring the time during which a predetermined quantity of neutrons are received by said detector, comparing the measured time with a known time required for the receipt by said detector of the same said predetermined quantity of neutrons when said vessel contains pure water, and displaying the concentration of said boron as a function of said measured time which is in the excess of said known time.

4,081,684
COMBUSTION PRODUCT DETECTOR

Horst K. Wieder, 1207 Riverview La., Watertown, Wis. 53094

Continuation-in-part of Ser. No. 485,120, Jul. 2, 1974, Pat. No. 3,892,930. This application Jun. 30, 1975, Ser. No. 592,028
Int. Cl.² G01T 1/18; H01J 39/28
U.S. Cl. 250—381 13 Claims

10. In a device for producing a voltage change in an electrical circuit in response to the presence of combustion products in a portion of the device, the combination of:

a radioactive source,

said source disposed in an electrically shielded space,

said shielded space being the portion of the device wherein the presence of combustion products causes said voltage change to be produced,

said shielded space defined by:

an electrically conductive housing member having an aperture to receive a test member and having apertures to admit combustion products to said space, and

electrically conductive material in electrical contact with said housing member,

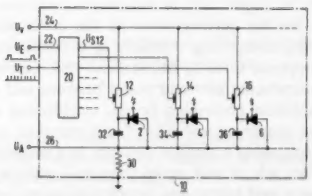
said electrically conductive material which with said housing member defines said shielded space is a layer of metal on a printed circuit board,

a field effect transistor and two resistors are provided within said shielded space and are disposed in close proximity to said source and to said printed circuit board and the lengths of the leads of said transistor and resistors are minimized.

4,081,685
ARRANGEMENT FOR THE PREPARATION OF A BODY CROSS-SECTION IMAGE

Roland Berger, Bubenreuth, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Nov. 1, 1976, Ser. No. 737,261
Claims priority, application Germany, Nov. 12, 1975, 2550868
Int. Cl.² H05G 1/30
U.S. Cl. 250—416 TV 6 Claims



1. In an arrangement for the preparation of a body cross-section image in which picture elements are derived from the absorption of ionizing rays which penetrate the corresponding body element in the body cross-section plane in different directions, which arrangement includes a multiplicity of detectors arranged side by side in the body cross-sectional plane with the electrical signals from the detectors provided as inputs to electronic circuitry which carries out image processing therefrom, the improvement comprising:

a. an electronic switch associated with each detector coupling one side thereof to a positive voltage, each of said switches having a control electrode;

b. a shift register having its respective outputs coupled to the control electrodes of said switches;

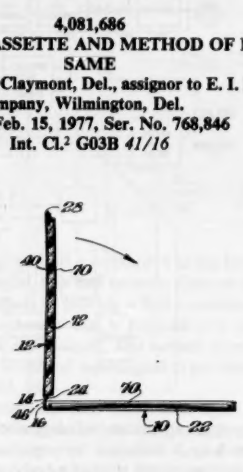
c. a common load resistor coupling the other sides of all said detectors to a reference potential; and

d. means for coupling the voltage across said resistor as the input for the electronic circuitry.

4,081,686
X-RAY FILM CASSETTE AND METHOD OF MAKING SAME

Gerrit Nieuweboer, Claymont, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 15, 1977, Ser. No. 768,846
Int. Cl.² G03B 41/16
U.S. Cl. 250—480 8 Claims



1. A cassette for holding X-ray sheet film during exposure to radiation, said cassette comprising, in combination:

first and second hinged, interlocking, flexible plates, said plates having a hinge axis, said plates each having an inner surface;

latch means for securing said plates together such that their inner surfaces are in closed, mating relationship;

said first plate defining only a curve protruding toward said second plate, about an axis parallel to said hinge axis;

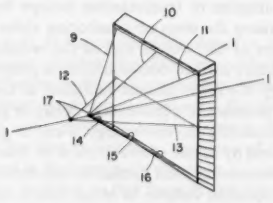
said second plate defining a complex curve arched toward said first plate in two directions substantially at right angles to each other; and

an X-ray intensifying screen on one of said inner surfaces.

4,081,687
COLLIMATOR FOR GAMMA RAY CAMERAS

Richard N. York, and David L. York, both of Lockport, Ill., assignors to Precise Corporation, Lockport, Ill.

Continuation of Ser. No. 608,071, Aug. 27, 1975, abandoned. This application Dec. 8, 1976, Ser. No. 748,521
Int. Cl.² G21K 1/02
U.S. Cl. 250—505 7 Claims



1. A collimator for cameras of the gamma ray type, compris-

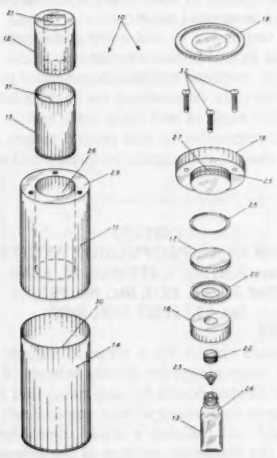
ing a plurality of elongated apertures having radiation opaque walls, a first undulating strip of radiation opaque material to form a part of said walls, a second undulating strip of radiation opaque material overlaid on said first strip, first projections of each of said strips extending in one direction from the surface plane thereof, second projections of each of said strips extending in the opposite direction from said plane, said first and second projections of each strip being alternately disposed between respective ones of the other, the first projections of said first strip being placed in underlying contact with respective ones of the second projections of said second strip thereby forming a plurality of said elongated apertures in a first aperture row between said first and second strips, a third undulating strip of radiation opaque material having said first and second projections overlaid on said second strip with the first projections of said second strip in underlying contact with respective ones of the second projections of said third strip to form a second aperture row of said elongated apertures, said first and second aperture rows being in stacked relationship, the axes of the apertures in said first aperture row lying in a first plane, the axes of the apertures in said second aperture row lying in a second plane spaced apart from said first plane, the walls of said elongated apertures in each of said aperture rows converging from a first rear facing side of said collimator to a second front facing side thereof, the extended area of said apertures in said aperture rows converging to respective focal points for each aperture row, said focal points of each aperture row lying in turn on the extended central axis of said collimator located outwardly from said second front facing side of said collimator, said focal point of each aperture row being a fixed distance from its respective aperture row, said fixed distance being the same for the focal point of each aperture row.

4,081,688

SHIELDED CONTAINER

Bernard A. Fries, Orinda, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Jul. 22, 1976, Ser. No. 707,805
Int. Cl.[2] G21F *5/00*
U.S. Cl. 250—506 **5 Claims**



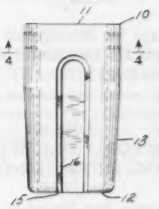
1. A shielded container for radioactive material comprising
(a) a first cylindrical shield formed of radiation-resistive material, having a sidewall defining a central repository, a bottom wall, and a top cap, said top cap also being of radiation-resistive material and including an O-ring at a reduced end segment in contact with said side wall to form a pressurized joint for said central repository;
(b) a second cylindrical shield of radiation-resistive material having a side wall, and a central opening, said second shield being slideably positioned within said repository of said first shield;
(c) a bottle means of glass slideably located within said central opening of said second shield, said bottle means having a mouth, a bottle cap attached to said bottle mouth and a central cavity in which resides said radioactive material;
(d) a first machine-sealable, thin-walled can for nestedly receiving (b) and (c) therein;
(e) a second machine-sealable, thin-walled can for nestedly receiving (a), (b), (c) and (d) therein; and
(f) said first and second cans each including machine-sealable top, bottom and side walls.

4,081,689

RADIOACTIVE SHIELDING MATERIAL

Meyer M. Reiss, Center Moriches, N.Y., assignor to Atomic Products Corporation, Center Moriches, N.Y.

Filed Sep. 17, 1976, Ser. No. 724,116
Int. Cl.[2] G21C *11/00*
U.S. Cl. 250—515 **3 Claims**



1. A radiation shield for use in enclosing radioactive hand operated instrumentation consisting of a main body of shield material formed from depleted uranium 238, and a layer of material deposited upon an exposed surface of said main body, said layer being at least partially impervious to the passage of residual beta ray defusion from said main body.

4,081,690

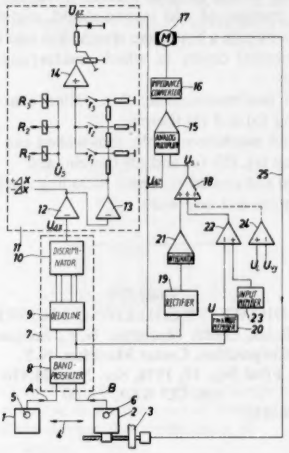
AUTOMATIC PHOTOGRAMMETRIC STEREO PLOTTER

Klaus Grubner, Jena, Gera; Werner Kunze, Jena-Winzerla, Gera, and Werner Marckwardt, Jena-Lobeda, Gera, Germany, assignors to Jenoptik Jena G.m.b.H., Jena, Germany

Filed Nov. 17, 1976, Ser. No. 740,453
Int. Cl.[2] G01C *11/12*
U.S. Cl. 250—558 **1 Claim**

1. An automatic photogrammetric stereo plotter comprising two photographs,
drive means for displacing at least one of said photographs,
two scanning means for scanning said photographs to detect homolog points in said photographs and for converting optical signals into electric signals,
a correlator for comparing said electric signals obtained from the one of said photographs to the electric signals obtained from the other of said photographs, and to form a parallax error signal,
an amplifier unit comprising
at least one operational amplifier of stepwise controllable amplification in dependence on the size of a scanned image area,
said amplifier unit amplifying said parallax error signal,
an analog multiplier for continuously varying the amplification in dependence on a control voltage and for multiply-

ing said control voltage by the amplified parallax error signal, a servo-motor for operating said drive means,



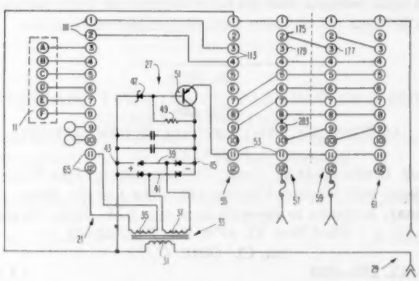
and a power stage for driving said motor by the product obtained from out of the control signal and said amplified parallax error signal.

4,081,691

CONTROLLER FOR A MULTIPLE STAGE POWER DEVICE HAVING INTERCHANGEABLE CONTROL UNITS

Egils Evalds, Ardmore, and Ernest F. Coccio, Conshohocken, both of Pa., assignors to Athena Controls Inc., West Conshohocken, Pa.

Filed Aug. 5, 1976, Ser. No. 712,027
Int. Cl.² H02J 3/14
U.S. Cl. 307—41 **6 Claims**



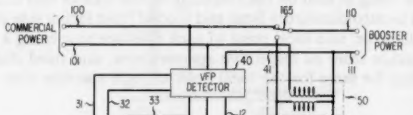
1. A system for turning on and alternatively turning off a plurality of electrical power stages, related to providing energy for a specific location, so that the total electrical power demand for said location is incrementally increased or decreased by an addition and alternatively a subtraction of said stages comprising in combination: a major control circuit board having a plurality of electrically connectable means each of which is disposed in a different position, said major control circuit board further having electrical circuit path means connecting said plurality of electrically connectable means and further having a source of electrical power connected to said electrical circuit path means; an interface circuit board means connected to said major control board at a first of said electrically connectable means, the interface circuit formed to accept monitoring signals from said location and convert said monitoring signals into command signal form; pulse forming circuit board means connected to a second of said electrically connectable means, to receive said command signal through said electrical circuit path means to selectively generate ADD and SUBTRACT pulses in response thereto; a plurality of stepper circuit board means connected respectively to said plurality of power stages and further connected to said major control circuit board at a plurality of said electrically connectable means to respectively receive said ADD and SUBTRACT pulses and in response thereto cause said power stages to be activated and alternatively deactivated; and feedback circuit means connected to each of the stepper circuit boards and the pulse forming circuit board to provide an analog signal indicative of the number of said power stages activated whereby the period between the generation of said ADD and SUBTRACT pulses will be altered depending on the number of said power stages activated.

4,081,692

APPARATUS FOR SUPPLEMENTING COMMERCIAL POWER SUBJECT TO BROWNOUT AND BLACKOUT FAILURES

Harold Seidel, Warren, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 9, 1976, Ser. No. 740,314
Int. Cl.² H02J 9/00
U.S. Cl. 307—64 **20 Claims**



1. Apparatus for supplementing commercial power comprising:

an alternator, driven by a main shaft, connected to supplement said commercial power;

first means, responsive to said commercial power, for controlling the output of said alternator;

second means, responsive to said commercial power and to said alternator, for determining the angular frequency and spatial phase angle of said main shaft; and

third means, responsive to said second means, for driving said main shaft at said angular frequency and spatial phase angle.

4,081,693

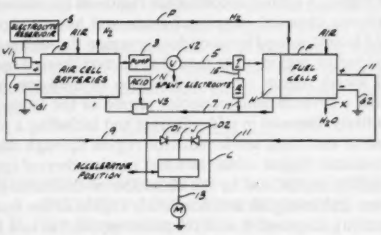
VEHICULAR PROPULSION SYSTEM

Gordon R. Stone, R.R. No. 1, O'Fallon, Ill. 62269

Filed Jul. 18, 1975, Ser. No. 597,031
Int. Cl.² H02J 7/00, 9/00
U.S. Cl. 307—66 **8 Claims**

1. A propulsion system for a wheeled vehicle comprising electric motor drive means for driving wheels of the vehicle and a source of electric power for energizing said drive means, said power source comprising at least one fuel cell and at least one primary air cell utilizing a liquid electrolyte which is heated during the discharge reaction of the primary cell, said air cell having a consumable replaceable anode and producing hydrogen as a product of the discharge reaction thereof, said fuel cell adapted to produce electrical energy when supplied with hydrogen, means for transmitting the hydrogen so produced by the primary cell to the fuel cell, means in heat-exchange relationship with said fuel cell, means for recirculating the heated electrolyte through the heat-exchange means thereby to cool said primary cell and heat said fuel cell, a radiator through which the heated electrolyte may be recircu-

lated when its temperature exceeds a predetermined level, switching means adapted alternately and selectively to electrically interconnect the fuel cell and primary air cell to the drive means, said switching means being responsive to the power output of the fuel cell whereby upon the power drain of the drive means exceeding that available from the fuel cell power will be supplied from the primary air cell, said switching means including means responsive to the relative output potentials of the fuel and air cells to interconnect the primary air cell to the drive means for only so long as the fuel cell potential remains below a certain level and is responsive to a rise thereabove to



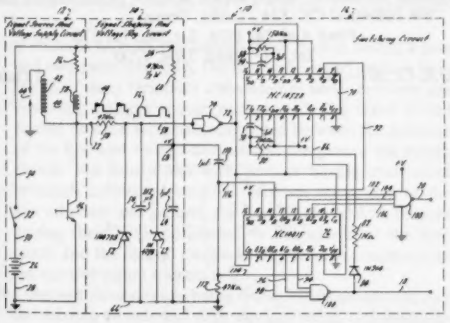
disconnect said primary cell and reconnect the fuel cell to the drive means, the switching means comprising a pair of diodes, two like electrodes thereof being commonly connected to the drive means, and the other electrodes thereof being respectively connected to said primary air cell and the fuel cell, means for sensing increasing alkalinity of said electrolyte during operation of the primary air cell, means responsive to said sensing means to supply an acid to said electrolyte to control the pH of the electrolyte to a desired level, and means for varying the amount of electrical power supplied from said power source to said drive means thereby to control the speed of the vehicle.

4,081,694

CIRCUIT FOR DETECTING THE OCCURRENCE OF A PREDETERMINED INPUT FREQUENCY

Richard V. Abdoo, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Aug. 23, 1976, Ser. No. 716,866
Int. Cl.² H01H *47/20*
U.S. Cl. 307—129 **6 Claims**



1. A frequency responsive switching circuit, which comprises:

circuit means for generating a periodic first electrical signal;

circuit means, comprising a retriggerable monostable multivibrator having a trigger input responsive to said first electrical signal, for generating a second electrical signal, said second electrical signal appearing at an output of said retriggerable monostable multivibrator and having a voltage that varies from a first level to a second level and then back to its first level if the period of said first electrical signal exceeds a predetermined amount of time, and said second electrical signal, once at its second voltage level, being maintained at said second voltage level if the period of said first electrical signal is less than said predetermined amount of time; and

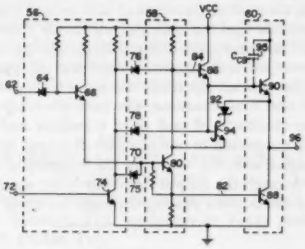
circuit means, responsive to said first and second electrical signals, for generating a third electrical signal, said third electrical signal having a first voltage level if the period of said first electrical signal exceeds said predetermined amount of time and having a second voltage level if a plurality of periods of said first electrical signal occur during a time period that said second electrical signal is maintained at its second voltage level.

4,081,695

BASE DRIVE BOOST CIRCUIT FOR IMPROVED FALL TIME IN BIPOLAR TRANSISTOR LOGIC CIRCUITS

Gordon Hadfield Allen, and Kenneth Irving Ray, both of Mesa, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 30, 1976, Ser. No. 756,045
Int. Cl.² H03K *3/29, 19/08*
U.S. Cl. 307—209 **3 Claims**



1. A bipolar transistor logic circuit comprising:

(a) an input means for receiving digital logic signals at a first input terminal;

(b) a phase splitter means responsive to said digital logic signals for generating an in-phase signal and an out-of-phase signal;

(c) push-pull output driver means including an in-phase transistor and an out-of-phase transistor coupled to said in-phase signal and to said out-of-phase signal respectively and to an output terminal for setting the output terminal to a predetermined digital level;

(d) feedback means coupled between the output terminal and said in-phase transistor for providing base drive current to said in-phase transistor and for removing stored base charge from said out-of-phase transistor during switching;

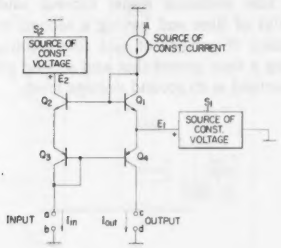
(e) three-state control means responsive to logic signals at a second input terminal and also being coupled to said output driver means and to said feedback means for selectively disabling said in-phase and out-of-phase transistors; and

(f) said feedback means being responsive to quiescent voltage levels at the output terminal for isolating said three-state control means from the output terminal.

4,081,696
CURRENT SQUARING CIRCUIT

Minoru Oda, and Shinzi Badono, both of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 10, 1976, Ser. No. 740,724
Claims priority, application Japan, Nov. 17, 1975, 50-137976
Int. Cl.² H03K 17/00
U.S. Cl. 307—229 4 Claims

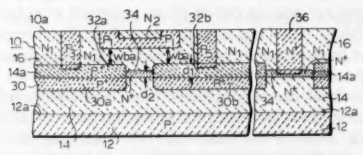


1. A circuit for squaring current, comprising, in combination, a first predetermined fixed voltage source, a second predetermined fixed voltage source, a source of constant current, a first transistor of a first type conductivity having the emitter electrode connected to said first predetermined fixed voltage source and the base electrode and the collector electrode connected to each other and to said source of constant current, a second transistor of the first type conductivity having the collector electrode connected to said second predetermined fixed voltage source, and the base electrode connected to said base electrode of said first transistor, a third transistor of a second type conductivity having the emitter electrode connected to the emitter electrode of said second transistor and the base electrode and the collector electrode connected to each other and to one of pair of input terminals for the input signal current, and a fourth transistor of the second type conductivity having the emitter electrode connected to said emitter electrode of said first transistor, the base electrode connected to said base electrode of said third transistor and the collector electrode connected to one of a pair of output terminals for the output signal current, whereby the magnitude of the current passing through the output terminals is the square of the magnitude of the current passing through the input terminals.

4,081,697
SEMICONDUCTOR MEMORY DEVICE

Takao Nakano, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 9, 1975, Ser. No. 639,237
Claims priority, application Japan, Dec. 16, 1974, 49-144771
Int. Cl.² H01L 27/10; G11C 11/40
U.S. Cl. 365—154 12 Claims

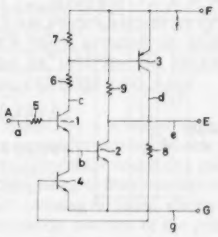


1. A semiconductor memory device including at least one memory cell having a flip-flop circuit formed of a first and a second transistor to perform the storing operation, and a third transistor and a fourth transistor for performing the writing-in operation and read-out operation with respect to said memory cell, which device comprises a substrate of semiconductive material having a pair of main opposite faces and including a first semicondutor region of a first type conductivity disposed therein and exposed to one of said main faces, a second semiconductor region and a third semiconductor region having a second type conductivity and disposed in said substrate and exposed to said one main face, each of said second and third semiconductor regions forming a junction between the same and said first semiconductor region, a fourth semiconductor region of the first type conductivity disposed in said substrate and exposed to said one main face and forming a junction between the same and said second semiconductor region, a fifth semiconductor region of the first type conductivity disposed in said substrate and exposed to said one main face and forming a junction between the same and said third semiconductor region, a sixth semiconductor region of the second type conductivity disposed in said substrate and having a portion opposed to said second semiconductor region through said first semiconductor region other than that portion thereof opposite to said fourth region and in a direction of thickness of said substrate, a seventh semiconductor region of the second type conductivity disposed in said substrate and including a portion opposed to said third semiconductor region through said first semiconductor region other than that portion thereof opposite to said fifth region and in the direction of thickness of said substrate, and an eighth semiconductor region of the first type conductivity disposed in said substrate opposed to said fourth and fifth regions through said first region and said second and third regions respectively in the direction of thickness of said substrate, said eighth region having a higher impurity concentration than said first region, and said device further comprising first connection means for electrically connecting said second region and said fifth region together, second connection means for electrically connecting said third region and said fourth region together, an X address line connected to said eighth region, A Y address line for supplying a current to said first and second connection means, a first write-in-read-out line connected to said sixth region, and a second write-in-read-out line connected to said seventh region. said first, second, fourth and eighth semiconductor regions forming said first transistor, said first, third, fifth, and eighth semiconductor regions forming said second transistor, said connection means connecting said first and second transistors in a flip-flop circuit, said first, second and sixth semiconductor regions forming said third transistor, and said first, third and seventh semiconductor regions forming said fourth transistor.

4,081,698
STEP-TO-IMPULSE CONVERSION CIRCUIT

Hiroshi Minakuchi, Shiga, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Aug. 24, 1976, Ser. No. 717,275
Int. Cl.² H03K 5/04, 4/00
U.S. Cl. 307—261 5 Claims



1. A step-to-impulse conversion circuit utilizing only nonreactive elements, comprising:

first, second and third transistors each having a control electrode, a first main electrode the potential of which varies directly in accordance with the potential of said control electrode, and a second main electrode the potential of which varies inversely in accordance with the

potential of said control electrode, each transistor being biased for operation in a switching mode;

an input terminal coupled to the control electrode of the first transistor;

an output terminal coupled to the second main electrode of said second transistor;

the first main electrode of the first transistor being coupled to the control electrode of the second transistor and the second main electrode of the first transistor being coupled to the control electrode of the third transistor;

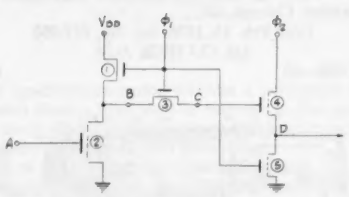
the first main electrodes of the second and third transistors being coupled to respective power supply terminals;

a switching element coupled between the control electrode of said second transistor and the power supply terminal to which said first main electrode of said second transistor is coupled, said switching element having a control terminal coupled to the second main electrode of said third transistor.

4,081,699
DEPLETION MODE COUPLING DEVICE FOR A MEMORY LINE DRIVING CIRCUIT

Ernie R. Hirt, Harleysville; William Mensch, Jr., Norristown, and Richard M. Greene, Audubon, all of Pa., assignors to MOS Technology, Inc., Norristown, Pa.

Filed Sep. 14, 1976, Ser. No. 723,207
Int. Cl.[2] H03K *17/60, 17/04, 17/12, 3/353*
U.S. Cl. 307—270 **3 Claims**



1. A single chip, MOS IC implemented, memory line driving circuit comprising:

a source of a control signal having a low and a high level, a source of an operating voltage and sources of a first and a second clock each alternating between a low and a high level, the high level of the clocks being comparable to that of the operating voltage and the two clocks complementing each other;

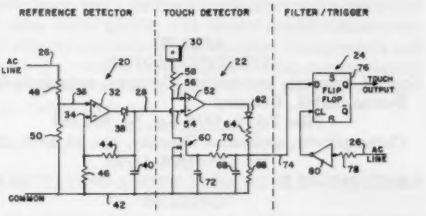
first through fifth MOS transistor devices each having a gate and two main terminals, the first and second devices having their main terminals connected in series between the operating voltage source and ground, the third device having its main terminals connected between the junction of the first and second devices and the gate of the fourth device, the fourth and fifth devices having their main terminals connected in series between the source of the second clock and ground, the first, third and fifth devices having their gates connected to the source of the first clock, and the second device having its gate connected to the control signal source; and

the first and third devices being depletion mode devices and the second, fourth and fifth devices being enhancement mode devices, the junction between the fourth and fifth devices providing a memory line driving signal, said memory line driving signal being at a high voltage level approximating the voltage level of the operating voltage supply and the high-level of the clocks when each of the control signal and the first clock are at their low levels while the second clock is at its high level, and said memory line driving signal being at a low level at all other times.

4,081,700
TOUCH CONTROL SWITCH CIRCUIT WITH COMPENSATION FOR POWER SUPPLY LINE FLUCTUATIONS

William F. Hamilton, II, 1512 Miramar Beach, Santa Barbara, Calif. 93108

Filed Jun. 16, 1976, Ser. No. 696,631
Int. Cl.[2] H03K *3/26*
U.S. Cl. 307—308 **13 Claims**



1. In a touch control switch circuit operable by a hum pickup signal derived from a power supply signal for detecting a touch input applied to the circuit, a compensation circuit for preventing false indications of touch inputs in response to fluctuations in the power supply signal, comprising:

a touch receptor operable by electrical contact with a human body for producing an oscillating signal which changes in amplitude in response to a touch input applied to said receptor;

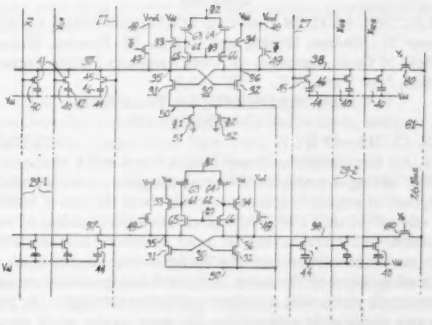
detecting means responsive to the oscillating signal produced by said touch receptor for producing an output signal to indicate the change in the amplitude of the oscillating signal; and

sensing means responsive to fluctuations in the power supply signal for applying a compensation signal to said detecting means to prevent a false output signal in response to any fluctuations in the power supply signal.

4,081,701
HIGH SPEED SENSE AMPLIFIER FOR MOS RANDOM ACCESS MEMORY

Lionel S. White, Jr.; Hugh P. McAdams, and Donald J. Redwine, all of Houston, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jun. 1, 1976, Ser. No. 691,735
Int. Cl.[2] H03K *5/20, 5/18, 3/286;* **G11C** *11/40*
U.S. Cl. 307—355 **11 Claims**



1. In a memory system of the type having an array of rows and columns of memory cells and a sense amplifier positioned at the center of each column line, the sense amplifier comprising a pair of cross coupled driver transistors and a load transis-

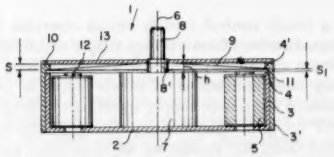
tor for each driver transistor, a supply voltage of a given value for the memory system, each of said transistors having a source-to-drain path and a gate, the improvement comprising a pair of switching devices each connected to discharge the gate of one of the load transistors, each of the switching devices having a source-to-drain path and a gate and a selected voltage applied to their gates which is less than said supply voltage, coupling means for applying a voltage to the gates of the load transistors sufficient to turn on the load transistors at a selected time, and means for precharging the column lines prior to said selected time.

4,081,702

STEPPING MOTOR

Gerhard Neumann, Immenstaad, Germany, assignor to Dornier System GmbH., Germany

Filed Feb. 9, 1976, Ser. No. 656,269
Claims priority, application Germany, Apr. 23, 1975, 2517974
Int. Cl.² H02K *37/00*
U.S. Cl. 310—49 R **3 Claims**



1. In a stepping motor, comprising a stator housing with electromagnets being annularly positioned therein, a flexible membrane mounted over said electromagnets on a bearing block shaft, said shaft being axially positioned within the stator housing, and said membrane being a magnetically-conducting annular disc,

the improvement comprising race means formed as an annular groove between a first peripheral wall of said stator housing and a second peripheral wall abutting and surrounding said first peripheral wall of said stator housing, whereby the membrane is prestressed on the side facing away from the electromagnets by pressing and is conically deformed by an amount coordinated to the step size and holding moment of the stepping motor, and including contact surface means on said membrane corresponding with the top of the annular groove on the one hand, and with the bottom of the annular groove on the other hand, said surface means being equivalent at the upper side and the underside of the membrane.

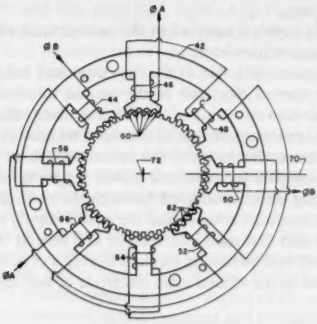
4,081,703

ELECTRIC MOTOR HAVING TOOTHED POLE PIECES

Elmer W. Madsen, Bristol, and Charles W. Hansen, Wolcott, both of Conn., assignors to North American Philips Corporation, New York, N.Y.

Filed May 26, 1976, Ser. No. 690,080
Int. Cl.² H02K *37/00*
U.S. Cl. 310—49 R **22 Claims**

1. An electric motor comprising a rotor and a cooperating stator having a multiple of four stator pole pieces which are disposed at angularly spaced intervals about the axis of rotation of said rotor, each stator pole piece having a plurality of teeth thereon, said teeth having an inner peripheral surface which lies on the circumference of a circle having its center on the axis of rotation of the rotor, said teeth being spaced on each stator pole piece with a uniform pitch therebetween, the pitch on one stator pole piece being the same as the pitch on any other stator pole piece, one of said stator pole pieces and an adjacent stator pole piece about the axis of the rotor comprising a pole pair, each two successive stator pole pieces disposed about the axis of the rotor comprising additional pole pairs, said plurality of teeth on one of said stator pole pieces in each of said pole pairs being shifted with respect to said plurality of



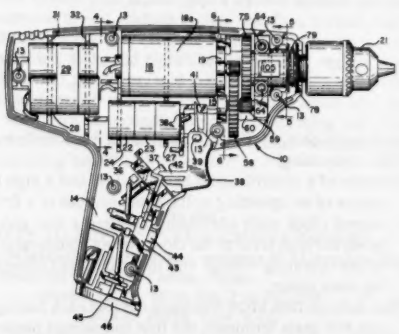
teeth on the other stator pole piece of the same pole pair one-half of said pitch.

4,081,704

POWERED HAND-HELD TOOL WITH UNITARY SUB-ASSEMBLY MOUNTED BY THE TOOL HOUSING SECTIONS

Louis J. Vassos, Park Ridge; John W. Heinz, Morton Grove, and James R. Hartmann, Chicago, all of Ill., assignors to Skil Corporation, Chicago, Ill.

Filed Feb. 13, 1976, Ser. No. 657,850
Int. Cl.² H02K *7/14*
U.S. Cl. 310—50 **9 Claims**



1. In a powered hand-held tool, the improvement comprising, in combination:

(a) at least two tool housing sections;

(b) fastening means connecting said housing sections together and thereby defining a substantially closed electric motor and gear compartment;

(c) a unitary sub-assembly including:

(1) rigid gear box frame means;

(2) a self-contained electric motor including a housing, said motor having an output member at one end of the housing thereof, said motor housing being mounted on said frame means only at said one end thereof;

(3) a spindle mounted on said frame means;

(4) reduction gear means mounted by said frame means and operatively connecting said motor output member with said spindle;

(d) first and second mounting means on said tool housing sections and sub-assembly, respectively, said first and second mounting means interengaging with each other in response to connecting said tool housing sections together

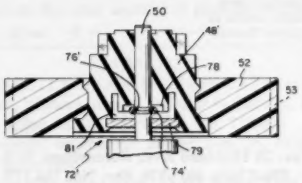
with said sub-assembly positioned in said compartment, the interengagement of said first and second mounting means serving as the sole means mounting said sub-assembly in place in said compartment, said first mounting means including mounting elements on at least one of said tool housing sections and said second mounting means including a portion of said motor housing adjacent the other end thereof whereby said electric motor is mounted in place by said frame means at said one end thereof and by the interengagement of a portion of said first and second mounting means at the other end of said motor housing, said frame means serving as the primary support means for said spindle and said reduction gear means.

4,081,705

MEANS LIMITING END PLAY OF A ROTOR OF A SYNCHRONOUS MOTOR

Ronald M. Johnson, Indianapolis, Ind., assignor to P. R. Mallory & Co. Inc., Indianapolis, Ind.

Filed Feb. 26, 1976, Ser. No. 661,493
Int. Cl.² H02K *5/16*
U.S. Cl. 310—90 **3 Claims**



1. In a synchronous motor wherein a permanent magnet rotor rotates about a fixed shaft in response to flux generated between stator poles and rotor poles carried by said permanent magnet rotor, the improvement comprising:

(a) a recess in said rotor surrounding said shaft,

(b) a first ring carried by said rotor and surrounding said shaft to close an open end of said recess and provide a resevoir in said rotor for receiving a lubricating fluid, and

(c) a second ring carried by said shaft in said resevoir,

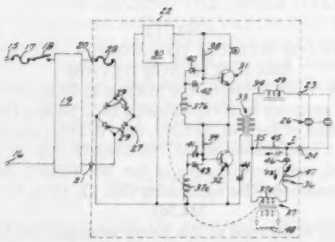
whereby upon axial displacement of said rotor along said shaft, said first and second rings engage each other to limit said axial displacement.

4,081,706

OSCILLATORY CIRCUIT FOR AN ULTRASONIC CLEANING DEVICE WITH FEEDBACK FROM THE PIEZOELECTRIC TRANSDUCER

Leon F. Edelson, Los Angeles, Calif., assignor to Delta Sonics, Inc., Long Beach, Calif.

Filed Oct. 21, 1976, Ser. No. 734,385
Int. Cl.² H01L *41/04*
U.S. Cl. 310—316 **6 Claims**



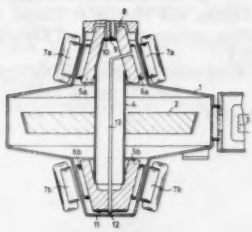
1. In an oscillatory circuit for an ultrasonic generator including a rectifier and filter network for providing a rectified voltage, a transistor network having a pair of transistor arrangements coupled to said rectifier and filter network and in series to each other and connected to inputs of a radio frequency transformer so that said transistor arrangements are cyclically rendered conductive in mutual opposition, and in which outputs of the radio frequency transformer are coupled through a series connected power inductance across piezoelectric ultrasonic transducer means, the improvement comprising feedback network means coupled in series with said ultrasonic transducer means and including a resistance series connected to said ultrasonic transducer means, and a capacitance, a feedback inductance, and a feedback transformer series connected to each other and in parallel with respect to said resistance for alternatively driving each of said transistor arrangements and for providing a variable phase shift in driving current thereto tending to hold the cyclic operation of said transistor arrangements at a target frequency.

4,081,707

X-RAY ROTATING-ANODE TUBE WITH A MAGNETIC BEARING

Walter Hartl; Harry Eggelsmann, both of Hamburg, Germany, and Claus-Peter Hodum, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 22, 1976, Ser. No. 753,181
Claims priority, application Germany, Jan. 16, 1976, 2601529
Int. Cl.² H01J *35/04*
U.S. Cl. 313—60 **5 Claims**



1. In a rotary anode tube with a rotary shaft and anode disc, said anode disc during operations being at a high voltage potential, said high voltage potential supplied by a moving contact located on one side of said disc and coupled to said rotary shaft, the improvement comprising a plurality of rotors electrically insulated from and supportively coupled to said rotary shaft, stator means including magnetic bearing means magnetically coupled to each of said rotors for supporting said rotary shaft for rotational freedom with respect to said stator means, and means conductively coupled to all of said rotors for placing each of said rotors at the approximate potential of said stator means.

4,081,708

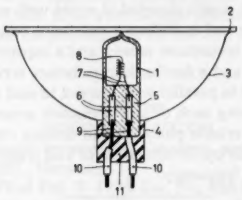
INCANDESCENT LAMP-REFLECTOR UNIT

Victor Rosallie Notelteirs, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 8, 1976, Ser. No. 693,946
Claims priority, application Netherlands, Jun. 18, 1975, 7507227
Int. Cl.² H01J *5/16, 61/40*; H01K *1/26, 1/30*
U.S. Cl. 313—113 **4 Claims**

1. An incandescent lamp-reflector assembly comprising an incandescent lamp and a metallic reflector having a generally concave surface for reflecting radiation emitted by the incandescent lamp, and a neck-shaped element cooperating with said concave surfaces, said incandescent lamp being a halogen lamp having a single pinch, a quartz glass lamp envelope, two internal conductors and two foils in said pinch seal, one end of each of said foils being connected respectively to one of said

internal current conductors, a filament disposed within said envelope and connected to the other ends of said internal current conductors, said lamp further including two external current conductors serving as contact pins at one extremity and at the other extremity being connected respectively to said foils, said pinch of the lamp envelope being disposed at least



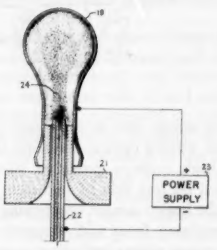
partly in said neck-shaped element with cement therebetween and with said contact pins extending beyond said neck-shaped portion and away from said concave surface, the distance from any bare part of any contact pin to any bare part of said metallic reflector being larger than the smallest distance between any part of any contact pin and said reflector.

4,081,709

ELECTROSTATIC COATING OF SILICA POWDERS ON INCANDESCENT BULBS

Clifford B. Collins, and William G. James, both of Cleveland Heights, Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed Nov. 20, 1975, Ser. No. 633,936
Int. Cl.² H01K *1/32*
U.S. Cl. 313—116 **12 Claims**



1. An electric lamp comprising a bulb having a light-diffusing coating on the inside thereof comprising an electrostatically deposited powder comprising light refractive particles having a particle size of 1 to 4 microns and a resistivity of 10^8 to 10^{11} ohm-centimeters.

4,081,710

PLATINUM-COATED IGNITERS

Alan Edward Heywood, and Robert Michael Hutchings, both of London, England, assignors to Johnson, Matthey & Co., Limited, London, England

Filed Jul. 8, 1976, Ser. No. 703,656
Claims priority, application United Kingdom, Jul. 8, 1975, 28703/75
Int. Cl.² H01T *13/20*
U.S. Cl. 313—141 **24 Claims**

1. An igniter comprising two or more electrodes separated by a body of insulating or semi-conducting material and having exposed working surfaces between which sparks may pass, at least part of the working surface or surfaces of at least one of the electrodes comprising a host material in which Co or Ni predominates alloyed or compounded with one or more additional metals selected from the group consisting of Ru, Rh, Ir, Pt, Ag and Au.

9. An igniter according to claim 1, wherein the host material is an alloy comprising 40 to 98 wt.% nickel and a trace to 30 wt.% chromium and wherein the additional metal or metals constitute from a trace to 15 wt.% of the total metal content.

11. An igniter according to claim 9, wherein the host material contains at least 40 wt.% Ni and from a trace to the percentage specified of any one or more of the following components:

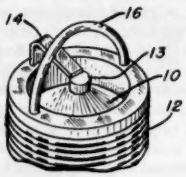
cobalt	25	wt.%
titanium	6	wt.%
aluminium	7	wt.
tungsten	20	wt.%
molybdenum	20	wt.%
hafnium	2	wt.%
manganese	2	wt.%
silicon	1.5	wt.%
vanadium	2.0	wt.%
niobium	5	wt.%
boron	0.15	wt.%
carbon	0.05	wt.%
tantalum	10	wt.%
zirconium	3	wt.%
iron	20	wt.%
thorium/rare earth metals or oxides thereof	3	wt.%.

4,081,711

SPARK PLUG

Bernard Wax, 28 Highland Ave., Succasunna, N.J. 07876

Filed Nov. 30, 1976, Ser. No. 746,175
Int. Cl.² H01T *13/20*
U.S. Cl. 313—143 **12 Claims**



1. A spark plug comprising,
a. a core of insulating material carried by a metal shell,
b. a center electrode carried by the core,
c. a ground electrode connected to the shell and spaced from an end of the center electrode to form a spark gap, and
d. solely a single arcuate ring member having its ends lying substantially on a diameter of the spark plug and secured to said shell, said ring member lying in a plane normal to the median plane of the spark plug which contains the ground electrode, said ring member spaced from and spanning the ground electrode.

4,081,712

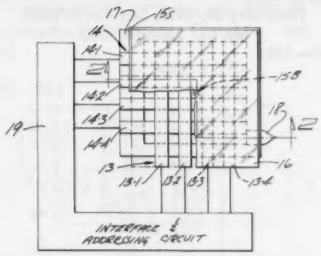
ADDITION OF HELIUM TO GASEOUS MEDIUM OF GAS DISCHARGE DEVICE

Wolfgang W. Bode, Sylvania, and Michael E. Fein, Toledo, both of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Continuation of Ser. No. 459,092, Apr. 8, 1974, abandoned, which is a continuation of Ser. No. 185,431, Sep. 30, 1971, abandoned, and a continuation of Ser. No. 185,432, Sep. 30, 1971, abandoned. This application Oct. 21, 1976, Ser. No. 734,561
The portion of the term of this patent subsequent to Oct. 21, 1992, has been disclaimed.
Int. Cl.² H01J *61/16*
U.S. Cl. 313—226 **4 Claims**

1. In a process for manufacturing a gas discharge display/-

memory device containing an ionizable gaseous medium and at least one electrode dielectrically insulated from the gaseous medium, the improvement which comprises filling the device with a gaseous medium comprising helium and a neon-based



gas mixture consisting essentially of about 90 percent to about 99.99 percent atoms of neon and about 10 percent to about 0.01 percent atoms of argon, xenon, or krypton, the helium being present in an amount of at least about 0.01 percent atoms of helium based on the total amount of gaseous medium present.

4,081,713

DIRECTLY HEATED OXIDE CATHODE

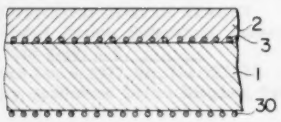
Akira Misumi, Mobara, Japan, assignor to Hitachi, Ltd., Japan

Filed Jul. 30, 1976, Ser. No. 710,303

Claims priority, application Japan, Jan. 28, 1976, 51-7491; Jan. 28, 1976, 51-7496

Int. Cl.[2] H01J *1/14, 19/06;* **H01K** *1/04*

U.S. Cl. 313—346 R **15 Claims**



1. In a directly heated oxide cathode comprising a base metal substrate of alloy containing Ni as a host material and a layer of an electron emissionable oxide of alkaline earth metal deposited on a face side of the base metal substrate, an improvement which comprises powders of metal selected from the group consisting of Ni simple substance, Co simple substance, Ni-Co alloy, and alloy containing Ni, Ni-Co, or Co as a host material, deposited on both the face and back sides of the base metal substrate onto which the oxide is deposited whereby strains developed during diffusion of Ni are balanced on the face and back sides of the base material substrate thereby minimizing deformation thereof.

4,081,714

METHOD OF COATING THE INNER WALL OF A LOW-PRESSURE MERCURY VAPOR DISCHARGE LAMP WITH LUMINESCENT MATERIAL

Anthonius Clemens Mossel, Eindhoven, and Joannes Petrus Hertogh, Loon op Zand, both of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

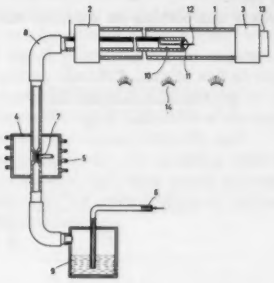
Filed Oct. 14, 1976, Ser. No. 732,472

Claims priority, application Netherlands, Oct. 17, 1975, 7512190

Int. Cl.[2] H01J *61/46*

U.S. Cl. 313—493 **5 Claims**

1. A method of coating the inner wall of the envelope of a low-pressure mercury vapour discharge lamp with luminescent material which comprises: providing a suspension of luminescent material, introducing into said suspension a quantity of 0.01% by weight to 1.0% by weight of a material selected from the group consisting of stearic acid, palmetic acid, and salts thereof, in addition to a quantity of 0.1% by weight to 3.0% by weight of a nitrate, introducing said suspension into



the lamp envelope by means of a gas stream, and conveying said suspension by means of an electric field to the wall of the lamp envelope.

4,081,715

LUMINESCENT DISPLAY TUBE WITH PLURAL CATHODES AND ELECTRON FLUX DISPERSING MEANS

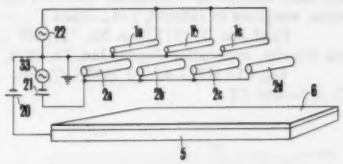
Sashiro Uemura, Watara: Japan, assignor to Ise Electronics Corporation, Ise, Japan

Filed Feb. 28, 1977, Ser. No. 772,556

Claims priority, application Japan, Mar. 1, 1976, 51-21928; Mar. 1, 1976, 51-21930

Int. Cl.[2] H01J *63/06, 29/50*

U.S. Cl. 315—13 R **8 Claims**



1. In an electronic device of the type comprising an evacuated envelope, a plurality of spaced apart elongated cathode electrodes which are disposed in parallel in the same place in said envelope for emitting an electron flux, and an anode electrode opposing said cathode electrodes, the improvement which comprises a plurality of electron flux dispersing members disposed between said cathode electrodes and said anode electrode and extending in the longitudinal direction of said cathode electrodes, and means for impressing direct current potential and alternating current potential upon said electron flux dispersing members for dispersing said electron flux in the transverse direction of said cathode electrodes thereby uniformly distributing said electron flux on said anode electrode.

4,081,716

FLUORESCENT DISPLAY ELEMENTS

Sashiro Uemura, Mie, Japan, assignor to Ise Electronics Corporation, Ise, Japan

Filed Feb. 28, 1977, Ser. No. 772,555

Claims priority, application Japan, Mar. 1, 1976, 51-21927

Int. Cl.[2] H01J *31/12, 63/06, 41/36*

U.S. Cl. 313—63 **14 Claims**

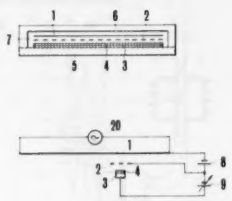
1. A fluorescent display element comprising:

a substrate;

a transparent envelope hermetically sealed to said substrate and forming an evacuated sealed space therebetween;

a switching element formed on said substrate within said sealed space;

a fluorescent film formed on a part of said switching element;



a cathode electrode provided within said sealed space in spaced-apart facing relationship with said flourescent film; and

a grid electrode interposed between and spaced apart from said cathode electrode and said fluorescent film.

4,081,717

ZIGZAG SHIFTING SELF-TRANSFER TYPE DISPLAY DEVICE

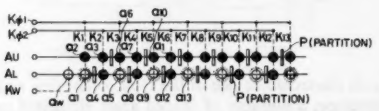
Tetsunori Kaji, Kanagawa, and Atsushi Sumioka, Hachioji, both of Japan, assignors to Hitachi, Ltd., Japan

Filed Jan. 3, 1977, Ser. No. 755,995

Claims priority, application Japan, Jan. 12, 1976, 51-2076

Int. Cl.[2] H01J *61/10*; H05B *41/00*

U.S. Cl. 315—169 TV **2 Claims**



1. A self-transfer display device, comprising:

a first electrode group which consists of a plurality of electrodes being substantially parallel to one another,

a second electrode group which consists of a plurality of electrodes lying in cubic crossing to the electrodes of said first electrode group and being substantially parallel to one another,

optical elements which have a memory function and which are respectively provided at points of the cubic crossing between the electrodes of said first electrode group and said second electrode group,

means for coupling light emission and means for decoupling the light emission as are alternately provided at every $k(k \geqq 2)$ adjacent optical elements disposed along each of said electrodes of said first electrode group, and

means for coupling the light emission as is provided between the optical elements disposed along n $(n \geqq 2)$ adjacent electrodes of said first electrode group,

whereby the state of light emission occurring in the optical elements advances in a predetermined direction while shifting zigzag.

4,081,718

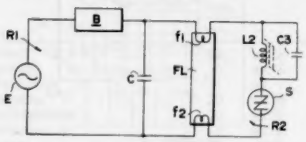
DISCHARGE LAMP LIGHTING DEVICE USING A BACKSWING BOOSTER

Isao Kaneda, Otsu, Japan, assignor to NEC Sylvania Corporation, Tokyo, Japan

Filed May 20, 1975, Ser. No. 579,092

Int. Cl.[2] H05B *41/232*

U.S. Cl. 315—244 **10 Claims**



1. In a discharge lamp lighting device comprising a discharge lamp, a power source, ballast means connected in series with said discharge lamp; and a backswing booster for igniting said discharge lamp; the improvement comprising a source voltage supply circuit coupling said source to said discharge lamp and said backswing booster for operating said discharge lamp and said backswing booster at different voltages, wherein the voltage applied to said discharge lamp enables said discharge lamp to sustain an arc discharge of said discharge lamp when it has been ignited, and wherein the voltage applied to said backswing booster is so established to operate said backswing booster when its starts and to disable operation of said backswing booster by decreasing the maximum vector of said applied voltage when said discharge lamp is ignited and operating.

4,081,719

DOUBLE ENDED THYRATRON WITH TRIGGER IMPULSE MEANS

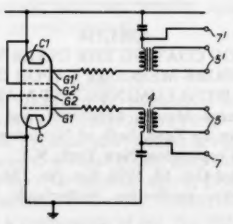
Robert Bewes Molyneux-Berry, Chelmsford, England, assignor to English Electric Valve Company Limited, England

Filed Feb. 2, 1977, Ser. No. 765,051

Claims priority, application United Kingdom, Feb. 3, 1976, 4113/76

Int. Cl.[2] H01J *17/12, 17/54*

U.S. Cl. 315—350 **8 Claims**



1. A double-ended thyratron arrangement including a double-ended thyratron in which, at both ends, the final grid which borders a high voltage gap is connected to act as a screen electrode and, at least at one end, means are provided for applying triggering input pulses to an intermediate grid between the cathode and the aforementioned final grid.

4,081,720
STOPPER DEVICE

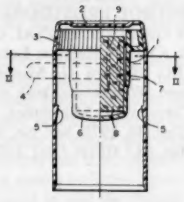
Hans Pfefferkorn, Beethovenstrasse 19, 654 Simmern; Bernd Pfefferkorn, Gass 9, 6541 Kulz, and Viktor Reiter, An der Schneiderburg, 654 Simmern, all of Germany

Filed Jul. 15, 1977, Ser. No. 816,105

Claims priority, application Germany, Apr. 2, 1977, 7710510[U]

Int. Cl.² B65D *41/60*

U.S. Cl. 215—354 **2 Claims**



1. A stopper device, particularly for wine bottles, comprising a hollow body of synthetic material defining a cavity open at the top and closed at the bottom thereof and having a fluted flange at the upper end thereof, and a cap mounted on said fluted flange and engaging the flutes thereof to preclude any relative rotary motion between said flange and said cap characterized in that the wall of said body includes an upper bulging portion and a lower cylindrical portion and that a cylindrical stopper of cork is press-fitted into said upper and said lower portions.

4,081,721
CONDUCTION OVERLAP CONTROL CIRCUIT FOR SWITCHED OUTPUT STAGES

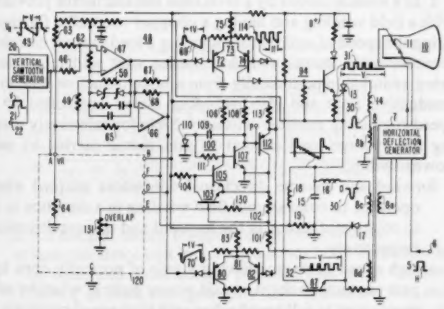
Peter Eduard Haferl, Zurich, Switzerland, assignor to RCA Corporation, New York, N.Y.

Filed Jan. 6, 1977, Ser. No. 757,375

Claims priority, application United Kingdom, Feb. 4, 1976, 4406/76

Int. Cl.² H01J *29/70, 29/72*

U.S. Cl. 315—389 **7 Claims**



1. Feedback overlap control means for a television kinescope drive apparatus comprising:

a horizontal deflection circuit for producing a recurrent horizontal deflection drive signal;

a vertical deflection winding disposed about the kinescope for deflecting an electron beam of the kinescope vertically in response to current therethrough;

a source of recurrent vertical-frequency sawtooth signal;

vertical deflection means responsive to said vertical-frequency sawtooth signal for applying successively smaller portions of the energy of said horizontal deflection drive signal during a first interval of the vertical deflection period and successively greater portions of the energy of said horizontal deflection drive signal during a second interval of the vertical deflection period to said vertical deflection winding for producing a vertical-frequency sawtooth current therethrough, a predetermined contemporaneity of said first and second intervals being optimum;

said feedback overlap control means further comprising;

summing and signal processing means responsive to said vertical-frequency sawtooth current and to said vertical frequency sawtooth signal for generating at an output terminal a first error signal indicative of the contemporaneity of said first and second intervals, and

error signal coupling means for coupling said first error signal to said vertical deflection means for reducing the difference between the contemporaneity and said predetermined contemporaneity.

4,081,722
SIGNAL PROCESSOR FOR SWITCHED VERTICAL DEFLECTION SYSTEM

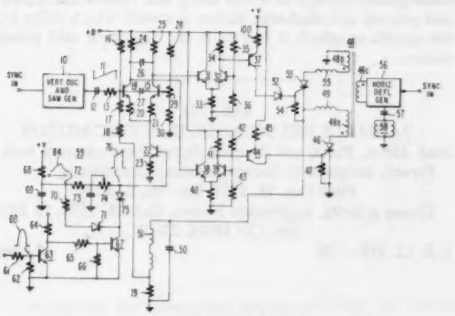
Peter Eduard Haferl, Adliswil, Switzerland, assignor to RCA Corporation, New York, N.Y.

Filed Feb. 7, 1977, Ser. No. 766,562

Claims priority, application United Kingdom, Mar. 19, 1976, 11271/76

Int. Cl.² H01J *29/72*

U.S. Cl. 315—393 **5 Claims**



1. A signal processor for a switched vertical deflection system, comprising:

a source of horizontal rate energy;

switching means coupling said horizontal energy to capacitance means;

a vertical deflection winding coupled to said capacitance means;

a source of vertical rate signals;

a horizontal rate generator producing horizontal rate signals; and

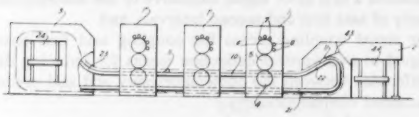
modulating means coupled to said horizontal rate generator, said source of vertical signals and to said switching means for producing switching signals at a horizontal rate modulated by said vertical signals for controlling said switching means such that said capacitor is charged with decreasing amounts of said horizontal rate energy during a first portion of each vertical trace interval and with increasing amounts of said horizontal energy during a second portion of said vertical trace interval, the discharge of said capacitor providing a sawtooth scanning current in said vertical deflection winding;

said horizontal rate generator including means for producing said horizontal rate signals including a nonlinear ramp portion for varying the position of said horizontal rate switching signals and thereby the gain of said vertical system during said trace interval.

4,081,723
PRINTING MACHINE

Lothar Vetter, Radebeul; Karl-Heinz Förster, Dresden, and Klaus Schanze, Coswig, all of Germany, assignors to Veb Polygraph Leipzog Kombinat fur Polygraphische Maschinen und Ausrustungen, Leipzig, Germany

Filed May 2, 1975, Ser. No. 574,092
Int. Cl.[2] H02K *41/02*
U.S. Cl. 318—38 11 Claims

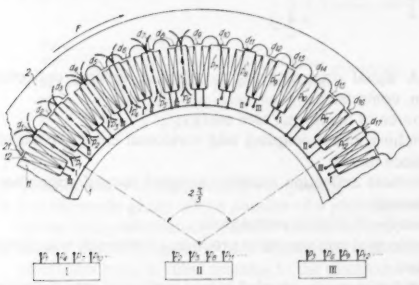


1. In a printing machine, a combination comprising a sheet printing station; a sheet pick-up station ahead of said printing station; a sheet discharge station past said printing station; linear motor means, including electrically conductive rails constituting the stators of said motor means and mounted at opposite lateral sides of said stations and each forming and endless loop which connects all of said stations, and a carriage mounted on said rails for travel along the same and constituting the armature of said motor means; sheet gripping means on said carriage for picking respective sheets up at said pick-up station, supplying them to said printing station and depositing the printed sheets at said discharge station; and control means for causing said carriage to travel along said rails in the region of said pick-up and discharge station at speeds which differ from the speeds at which it travels in the region of said printing station.

4,081,724
VARIABLE RELUCTANCE ELECTRIC MOTOR

Jean Jarret, Paris, and Jacques Jarret, Louveciennes, both of France, assignors to Societe Elpalux, Luxembourg

Filed Oct. 18, 1976, Ser. No. 733,158
Claims priority, application France, Oct. 21, 1975, 75 32144
Int. Cl.[2] H02K *29/02*
U.S. Cl. 318—138 3 Claims

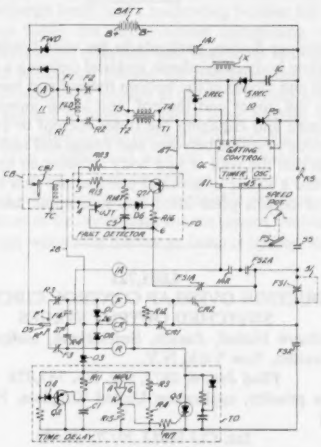


1. A variable-reluctance electric motor comprising a stator ring made of ferromagnetic material and having poles provided with induction windings distributed into four equal groups, at least one rotor ring of ferromagnetic material provided with equidistant teeth cooperating with the stator windings, and switching means actuated by the rotation of the rotor so as to distribute the supply of the stator windings from a d.c. voltage source, the windings and switching means being actuated so that, during each advance of the rotor by one tooth pitch, each pole is subjected to two opposite switching operations and, from one group of poles to the next one, the switching operations are staggered by a time equal to the time taken by the motor to advance by a quarter of a tooth pitch, characterized in that the stator poles (11) are equidistant, each bear an individual winding (12) and are equal in number to $4kl$ (where $k \geqq 2$ and l is any number), the rotor teeth (21) are in number equal to lm (where m is an odd number greater than 4k) and the switching means (I, II, III) are actuated so as to switch over the supply between two stator poles at each rotor advance of $\frac{1}{4}k$ of a tooth pitch, and m is chosen so that at each instant, energized poles alternate with non-energized poles except in the stator regions which have just been switched or about to be switched.

4,081,725
LIFT TRUCK CONTROL PROVIDING TIME DELAY IN OPERATION OF DIRECTIONAL CONTACTOR

Harvey E. Schmidt, Chicago Heights; Luke F. Henry, Homewood, both of Ill.; Howard G. Murphy, Greendale, and Thomas P. Gilmore, Wauwatosa, both of Wis., assignors to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Dec. 30, 1975, Ser. No. 645,325
Int. Cl.[2] H02P *1/00, 3/00*
U.S. Cl. 318—139 6 Claims



1. In a vehicle driven by a reversible electric motor provided with a field winding and having a chopper controller for regulating the speed of said motor including a load current carrying semiconductor power switch in series with said motor and being switchable periodically from a nonconductive state to a conductive state and also including means controlled by a speed regulating member on said vehicle for selectively varying the average load current to said motor carried by said power switch;

forward and reverse directional contactors adapted when operated to connect said field winding in a direction so as to rotate said motor in the forward and reverse directions respectively,

a high speed contactor having a pair of normally open bypass contacts in shunt to said power switch, whereby said motor runs at full speed when said high speed contactor is operated,

means including a direction switch having forward and reverse positions for selectively completing energizing circuits to said forward and to said reverse contactors respectively and also having a neutral position between said forward and reverse positions in which both of said directional contactors are released,

time delay means in series with said direction switch and said forward and reverse contactors responsive to actuation of said direction switch to said forward position or to said reverse position for completing an energizing circuit to the selected directional contactor after a first predetermined time interval,

fault detection means for sensing closure of said bypass contacts for a second predetermined time interval, which is less than said first predetermined interval, and for disabling said chopper controller in response thereto,

means responsive to operation of said speed regulating member to adjacent its maximum speed position for disabling said fault detecting means and for operating said high speed contactor,

said time delay means being set to its initial condition and said fault detection means being disabled when said direction switch is in said neutral position and said fault detection means being enabled when said direction switch is operated to either said forward position or to said reverse position, and

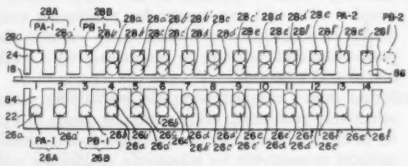
sequence-of-operation controlling means for preventing operation of either directional contactor if said speed regulating member is away from its minimum speed position at the instant said direction switch is actuated from said neutral position to either said forward position or to said reverse position and wherein said sequence-of-operation controlling means includes a pair of normally closed contacts connected in said directional contactor energizing circuits and which are opened when said speed regulating member is away from its minimum speed position and prevent subsequent operation of either directional contactor, in response to actuation of said direction switch between said forward and reverse positions, until said speed regulating member is at its minimum speed position, and wherein said sequence-of-operation controlling means also includes a pair of contacts in series with said time delay means and said directional contactors which contacts are open when said speed regulating member is at its minimum speed position and are closed to complete said directional contactor energizing circuits when said speed regulating member is partially operated.

4,081,726

ELECTRIC MOTOR

Claude Morris Brimer, Tuscon, Ariz., and Joe W. Von Brimer, deceased, late of Las Vegas, Nev. (by Claude Morris Brimer, executor), assignors to Linear International Corporation, Rancho La Costa, Calif.

Filed Jan. 5, 1976, Ser. No. 638,519
Int. Cl.² H02K *17/00*
U.S. Cl. 318—207 A **12 Claims**



1. An electric motor comprising, in combination,

at least one stator unit including a stator body defined in part by inner and outer margin portions, said stator body also having at least one generally flat surface portion and a plurality of spaced apart slots in said body, said slots communicating with said body surface and extending between said margins transversely of said stator body and said slots being of an open parallel side configuration,

at least two stator windings identifiable as separately energized, each having portions thereof lying in at least two pairs of said slots such that each motor pole consists of at least two separate coils each of said stator windings being adapted to be energized by an electrical source which is out of phase with respect to the source energizing another of said windings,

a rotor assembly having a motor drive shaft associated therewith, said rotor assembly including

an annular disc portion formed from electrically conductive non-magnetic material and having inner and outer margin portions defining the radially inner and outer edges thereof, said disc having between said margin portions a pair of generally flat, generally axially facing surfaces defining therebetween a principle disc body portion, the margins of said disc being respectively of greater inward and outward radial extent than the inward and outward radial extent of the margins of the stator which said disc is associated, said flat surface portion of said stator body being disposed in opposed facing relation to one of said surfaces of said disc body, said stator surface and said disc surface defining therebetween an axial air gap,

magnetically permeable means forming a return path for the magnetic fields generated in said stator, said return means also being spaced apart from said other disc surfaces by a second axial air gap,

means for reversing the electrical connections to said windings, whereby said motor may be operated reversibly,

a capacitor for creating phase shift whereby said motor is usable on commonly available single phase power supplies, and

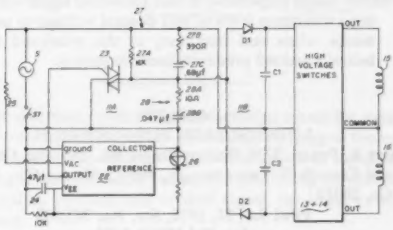
the value of capacitance being switchably changeable for providing varying output torques.

4,081,727

SPEED CONTROL

Aaron F. Green, 1 Holbrook Ct., Rockport, Mass. 01966

Filed May 3, 1976, Ser. No. 682,475
Int. Cl.² H02P *5/40*
U.S. Cl. 318—230 **16 Claims**



1. Apparatus for controlling the speed of an AC motor having at least one winding comprising:

means for providing a pair of DC voltage levels,

voltage switch means coupled from the converter means receiving the DC voltage levels and having an output coupling to the said at least one winding,

said voltage switch means having at least a pair of control inputs,

and speed control means coupled to said control inputs and comprising first means for providing a first control signal of first width coupled to one of the control inputs, second means for providing a second control signal of second width coupled to the other control input, and means for controlling the control signals to the voltage switch means to provide an off-time period wherein there is an absence of both control signals including means for adjusting the length of said off-time period to control motor speed.,

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4,081,728

DC MOTOR CONTROL CIRCUIT

Akira Nikami, Yokohama, and Choei Kuriki, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jul. 20, 1976, Ser. No. 707,041
Claims priority, application Japan, Jul. 24, 1975, 50-90642
Int. Cl.² H02P *5/06*
U.S. Cl. 318—318 **10 Claims**

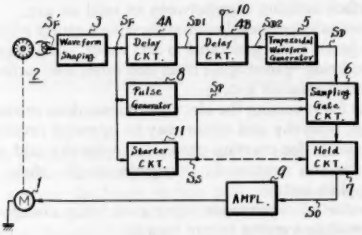
1. A DC motor control circuit comprising:

a DC motor the rotational speed of which is to be controlled;

means for producing a rotational signal at a frequency corresponding to the rotational speed of said DC motor;

means for producing a train of pulses at a repetition rate dependent on said frequency of the rotational signal, each of said pulses having a portion varying with time and occurring with a predetermined delay when said frequency of the rotational signal is lower than a first predetermined frequency;

means for providing sampling signals at intervals dependent on said frequency of the rotational signal;



sampling means receiving said train of pulses and being made operative by said sampling signals for sampling said pulses and for providing a control voltage varying with the deviation of said rotational speed from a predetermined velocity;

drive means for controlling said rotational speed in accordance with said control voltage; and

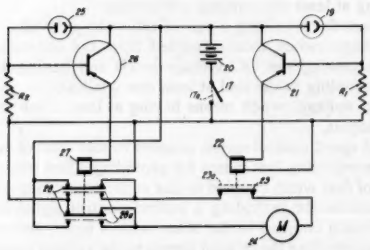
starter means responsive to said rotational signal for providing a maximum level of said control voltage to said drive means when said frequency of the rotational signal is below a second predetermined frequency.

4,081,729

LOW VOLTAGE PHOTOSWITCH

Larry E. Payne, 3224 Wesley Chapel Rd., Decatur, Ga. 30034, and Kenneth D. Lancaster, Jr., 965 Clubhouse Cir., Decatur, Ga. 30032

Filed Jul. 21, 1976, Ser. No. 707,383
Int. Cl.² H02P *7/74*
U.S. Cl. 318—480 **3 Claims**



1. A circuit for actuating a bi-directional motor to propel an element alternatively in a first direction and a second direction which is opposite from the first direction, comprising:

a. a power supply connected to said motor;

b. first switch means to cycle said power supply on and off;

c. a first light responsive means, adapted to receive first light signals, located in a first elongated light directing tubular member in said circuit and connected to said power supply;

d. a double acting relay operatively connected to said first light responsive means and being operable to alternately start and stop said motor in response to successive first light signals;

e. second switch means in said circuit operatively connected to said motor and said power supply, said switch means including first direction and second direction contacts and a switch element moveable between said contacts,

f. a second light responsive means adapted to receive second light signals, located in a second elongated light directing tubular member, in said circuit and connected to said power supply; and

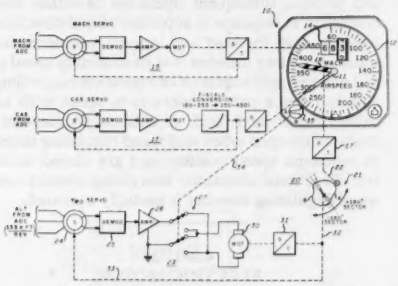
g. a reversing relay operatively connected to said switch element and being operable in response to said second light signals received by said second light responsive means to move said switch element alternately between said first and said second direction contacts to operate said motor respectively in said first and second direction.

4,081,730

MULTIPLE FUNCTION GENERATOR FOR AIRCRAFT FLIGHT INSTRUMENTS

William H. Murtland, Phoenix, Ariz., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Jun. 16, 1976, Ser. No. 696,457
Int. Cl.² B64C *31/18*
U.S. Cl. 318—584 **11 Claims**



1. In an aircraft flight instrument having an indicator positionable in accordance with a plurality of selectable functions of an input variable, comprising

cam means coupled with said indicator and having a plurality of surfaces shaped in accordance with said functions, respectively,

positioning means responsive to said input variable and coupled with said cam means for positioning said cam means in accordance with said input variable thereby positioning said indicator in accordance with a selected one of said functions,

indexing means coupled with said positioning means for selectively positioning said positioning means to a plurality of discrete positions corresponding to said plurality of surfaces respectively for selectively positioning said cam means to selectively render effective said functions, and selection means coupled with said indexing means for selecting said function.

4,081,731

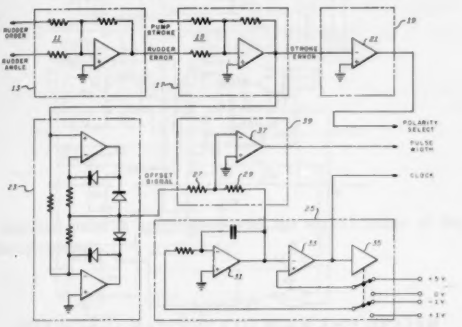
PULSE WIDTH MODULATED SERVO AMPLIFIER WITH OVER-CURRENT PROTECTION

Charles R. Wesner, Crozet, Va., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Aug. 3, 1976, Ser. No. 711,189
Int. Cl.² G05B *11/28*
U.S. Cl. 318—599 **8 Claims**

1. A servomotor drive circuit of the type in which the extent and direction of rotor movement is controlled by the duration and polarity, respectively, of pulses in an output pulse train; said circuit including dual channel amplifier means, and input circuit means to provide polarity select direction control signals and an input pulse width modulated wave train to said

amplifier means; the first and second of said channels each including means to enable only that channel in accordance with first and second values of the polarity select signal, respectively; means to pass the pulses in an input wave train through an enabled channel; power amplifying means in each channel connected to provide output pulses co-extensive with the pulses in the input wave train being passed by that channel, the amplifying means in said first and second channels being



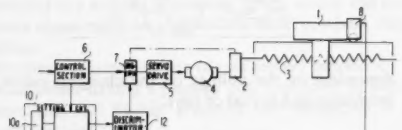
further connected to provide positive and negative output pulses, respectively; means for detecting the instantaneous magnitude of the current flowing through each power amplifying means; and means responsive to said detection means for disabling a channel whenever the magnitude of the detected current in that channel exceeds a predetermined value, said disabling means being operative to maintain the channel in a disabled condition until the start of the succeeding input pulse applied to that channel.

4,081,732

AUTOMATIC POSITIONING METHOD AND APPARATUS

Tadamasa Aoyama, 4034-1 Kamariya-cho, Kanazawa, Yokohama, Kanagawa, Japan, assignor to Tadamasa Aoyama, Yokohama, Japan

Filed Mar. 2, 1976, Ser. No. 663,203
Int. Cl.[2] G05B *19/28*
U.S. Cl. 318—603 **9 Claims**



1. In a machine tool apparatus having a stationary portion, a movable part and means including a motor for positioning the movable part along a predetermined path of travel with respect to the stationary portion of said apparatus; the improvement wherein the positioning means includes:

a. a setting circuit including a multiple switch for providing a first signal related in value to a predetermined distance of travel of the movable part from the starting position;

b. distance measuring means for providing a second signal related in value to the distance through which the movable part travels with respect to a starting position on the stationary portion of the apparatus; wherein said distance measuring means includes a member rotatably mounted on the movable part and frictionally engaging the stationary portion of the apparatus for generating an analog signal in response to movement of the member induced by the relative movement of the movable part with respect to the stationary portion of the apparatus;

c. subtracting means responsive to the first and second signals for providing an output signal related in value to the value of the second signal reduced by the value of the first signal; and,

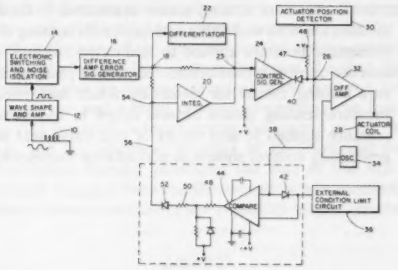
d. a discriminating circuit responsive to the attainment of a predetermined value by said output signal for providing a control signal to control the positioning of the movable part.

4,081,733

AUTOMATIC CONTROL SYSTEM WITH INTEGRATOR OFFSET

George H. Anderson, and William J. Barrett, both of Rockford, Ill., assignors to Barber-Colman Company, Rockford, Ill.

Filed Jun. 29, 1976, Ser. No. 700,970
Int. Cl.[2] G05B *11/36*
U.S. Cl. 318—610 **7 Claims**



1. In an automatic control circuit including means for generating an error signal, means for generating the integral thereof, means for producing a control signal from said error signal and said integral and including means for producing an external limit signal to override said control signal, the improvement comprising:

means for altering the input to said integrator means when said external limit signal overrides the control signal to maintain the output of said integrator means in the normal operating region for subsequent control signal generation after said external limit signal ceases to override said control signal, said altering means including an operational amplifier applying a signal to said integrator means input of a polarity opposite to the polarity of said error signal and of a magnitude substantially equal to or greater than said error signal.

4,081,734

PNEUMATIC FAIL-SAFE SENSOR SYSTEM FOR N/C MACHINE TOOL

Floyd E. MacSpadden, Kent; Frank A. Schellhase, Issaquah; Robert L. Strong, Auburn, and Jansey D. Tieden, Puyallup, all of Wash., assignors to The Boeing Company, Seattle, Wash.

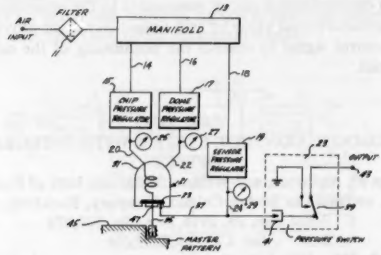
Division of Ser. No. 518,090, Oct. 25, 1974, Pat. No. 3,991,653.
This application Aug. 2, 1976, Ser. No. 710,625
Int. Cl.[2] G05D *16/00*
U.S. Cl. 318—645 **15 Claims**

1. A pneumatic sensor system comprising:

a pneumatic valve mechanism including a movable element and a valve seat, said valve seat having a cavity formed therein and being adapted for the application of pneumatic pressure into said cavity, said movable element being mounted relative to said valve seat for closure of said cavity to form a pressure sensing chamber, said movable element being displaceable relative to said valve seat for

opening said pressure sensing chamber to allow a drop in the pneumatic pressure applied to said cavity;

a probe connected to said movable element in a manner such that displacement of said probe displaces said movable element of said valve mechanism and opens pressure sensing chamber;



pneumatic pressure sensing means connected in fluid communication with said valve seat cavity for sensing drops in pneumatic pressure applied to said cavity; and,

electronic control means connected to said pneumatic pressure sensing means for detecting when said pneumatic pressure sensing means detects drops in the pneumatic pressure applied to said cavity of said valve seat and for generating control signals in accordance therewith.

4,081,735

MOTION CONTROL SYSTEM FOR AN INDUCTIVELY CONTROLLED MULTI-PHASE MOTOR

William Edward Bray, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 456,496, Apr. 1, 1974, Pat. No. 3,953,778. This application Feb. 17, 1976, Ser. No. 658,794

Int. Cl.[2] H02K *37/00*

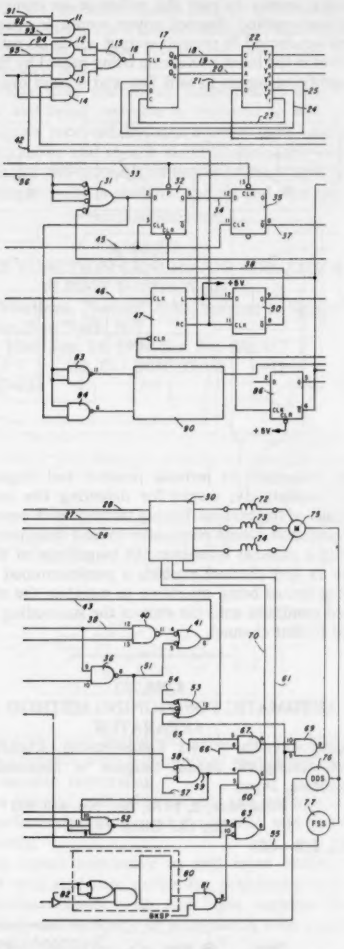
U.S. Cl. 318—696 **6 Claims**

1. In an electro-mechanical motion control system having at least one inductively controlled multi-phase motor with at least one coil corresponding to each phase and having current programming circuitry for providing desired current waveforms to the coils of the multi-phase motor and having selecting means for selecting the desired motor coil or coils, a velocity-sensitive circuit for providing current, comprising:

(a) electronic switching means, having a first main electrode connected to the current programming circuitry, a second main electrode and a control electrode;

(b) charging means, connected to the control electrode and connected to a voltage source; and

(c) a timing circuit, connected to the second main electrode, for enabling the electronic switching means to conduct current through its first main electrode in an amount



dependent on the voltage on the charging means for a predetermined period of time.

4,081,736

OPEN LOOP MOTOR STABILIZATION METHOD AND CIRCUIT

Albert C. Leenhouts, Harwinton, and Gurdial Singh, Avon, both of Conn., assignors to The Superior Electric Company, Bristol, Conn.

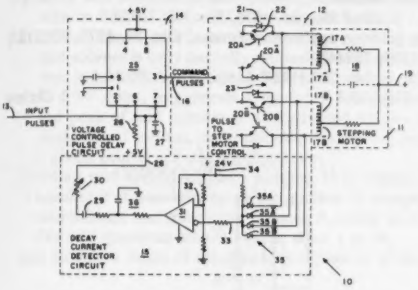
Filed Jul. 9, 1976, Ser. No. 704,005

Int. Cl.[2] H02K *37/00*

U.S. Cl. 318—696 **22 Claims**

1. The method of minimizing the tendency of a stepping motor to oscillate while at least operating in its mid-velocity range with the motor having a plurality of windings with the energization of the windings being changed essentially simultaneously with the occurrence of a command pulse comprising the steps of determining the receipt of an input pulse, transferring each input pulse after a nominal delay into a command pulse to effect a change of energization, sensing during the occurrence of the change of energization the existence of a

decay current in the windings and changing the extent of the delay in the step of transferring the next input pulse into a



command pulse in accordance with the sensed extent of the decay current.

4,081,737

SECONDARY BATTERY CHARGER AND HEATER

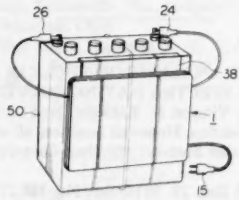
Hiroyasu Miyahara, 2435-9, Suehiro-cho, Honjo, Saitama, Japan

Filed May 28, 1976, Ser. No. 690,876

Claims priority, application Japan, Jun. 3, 1975, 50-75472; Oct. 9, 1975, 50-138745

Int. Cl.[2] H02J *7/00*; H05B *1/00*

U.S. Cl. 320—2 **7 Claims**



1. A secondary battery charger including first terminals connectable to a suitable alternating power source and second terminals connectable to a secondary battery, which charger comprises:

a rectifier connected to one of said second terminals;

a transformer having a primary coil connected to said first terminals and having a second coil connected to said rectifier; and

heating means located in thermal contact with the battery, said heating means comprising a magnetic plate provided in close proximity of said transformer in a manner to effectively generate heat due to eddy currents induced in the plate by leakage magnetic flux from said transformer.

4,081,738

PLURAL BATTERY CONTROL APPARATUS

William G. Roller, Purdy, Mo., assignor to G & R Industries, Inc., Purdy, Mo.

Continuation-in-part of Ser. No. 607,337, Aug. 25, 1975, abandoned. This application Dec. 9, 1976, Ser. No. 748,965

Int. Cl.[2] H02J *7/00*

U.S. Cl. 320—7 **5 Claims**

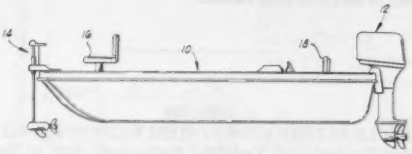
1. A plural battery control apparatus comprising:

a first battery providing a first output current at a first voltage;

a second battery providing a second output current at a second voltage substantially equal to the first voltage;

an electrical output connector having a first power terminal, a second power terminal and a common terminal; and

a 3-position mode switch connected to, and interposed between, the electrical output connector and the first and second batteries; the mode switch having a first position connecting only the first battery across the first power terminal and the common terminal of the electrical output connector, thereby providing the first output current at the first voltage between the first power terminal and the common terminal of the electrical output connector; a second position connecting the first and second batteries



in parallel across the first power terminal and the common terminal of the electrical output connector, thereby providing the sum of the first and second output currents at substantially the first voltage between the first power terminal and the common terminal of the electrical output connector; and a third position connecting the first and second batteries in series across the second power terminal and the common terminal of the electrical output connector, thereby providing the sum of the first and second voltages between the second power terminal and the common terminal of the electrical output connector.

4,081,739

CIRCUIT FOR QUICK CHARGING OF BATTERIES

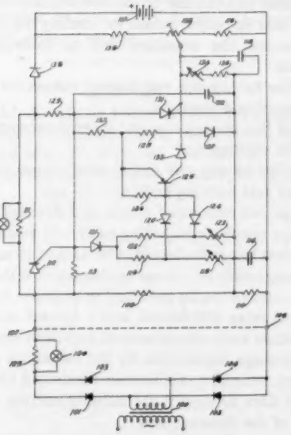
Egon Gahler, Hattersheim, Germany, assignor to Braun Aktiengesellschaft, Frankfurt am Main, Germany

Filed Jan. 28, 1977, Ser. No. 763,584

Claims priority, application Germany, Feb. 4, 1976, 2604198

Int. Cl.[2] H02J *7/10*

U.S. Cl. 320—32 **17 Claims**



1. A circuit of the type used for charging a battery from a voltage source, comprising, in combination, voltage supply terminals for connection to a voltage source; battery connection terminals for connection to a battery to be charged; circuit means connecting said voltage supply terminals to said battery connection terminals for the transmission of a charging voltage having a charging voltage value and providing a current path for the flow of charging current having a charging current

value, including first controllable switch means connected in said charging current path and having a conductive state and a non-conductive state; second controllable switch means connected to said first controllable switch means and operative upon the receipt of a control signal having a predetermined threshold value for changing the state of said first controllable switch means; means for applying to said second controllable switch means a control signal having a value varying in dependence upon variations in one of said charging values; and means for changing said threshold value of said second controllable switch means in automatic dependence upon changes in one of said charging values.

4,081,740

VEHICLE ALTERNATOR SYSTEM WITH NOISE FILTER

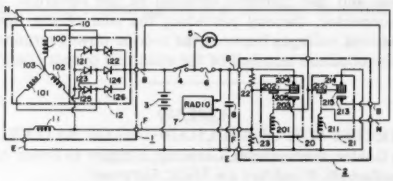
Tatsuo Teratani, and Yoshitaka Kuroyanagi, both of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Mar. 22, 1976, Ser. No. 669,031

Claims priority, application Japan, Mar. 31, 1975, 50-39323; Jun. 13, 1975, 50-2447

Int. Cl.[2] H04B *15/00;* H02J *7/22*

U.S. Cl. 322—28 **1 Claim**



1. An electric power source apparatus for vehicles comprising:

a dynamo including a rotor driven by a vehicle mounted engine, an exciting coil to which an exciting current is supplied, an armature coil across which a voltage is generated, and an output means for leading the voltage generator across the armature coil to externally utilization means;

a first line having one end thereof connected to said output means of said dynamo;

a second line having one end thereof connected to one end of said exciting coil;

a third line having one end thereof connected to the other end of said exciting coil;

a storage cell connected across said first and third lines;

a voltage regulator including relay coil means connected to said first line and adapted to be excited in accordance with the magnitude of voltage applied thereto through said first line, contact means switched in response to the excitation of said relay coil means, and a resistor connected across the other ends of said second and third lines for developing voltage thereacross by the switching of said contact means, whereby said resistor connected to said second or third lines to supply the exciting current to the exciting coil of the dynamo; and

a four terminal capacitor coupled to said first and third lines for absorbing high frequency noise generated on said first and third lines in response to the switching of said contact means of said regulator, said capacitor comprising:

a pair of overlapping capacitor electrodes; and

a pair of leads, each of said leads being electrically coupled along one edge of one of said capacitor electrodes, each of said leads having two ends thereby forming a four terminal circuit.

4,081,741

ON-LOAD TAP CHANGER

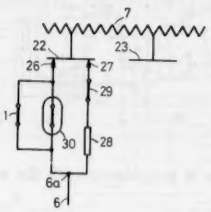
Peter Palmér, Ludvika, Sweden, assignor to ASEA Aktiebolag, Vesteras, Sweden

Filed Oct. 26, 1976, Ser. No. 735,203

Claims priority, application Sweden, Oct. 29, 1975, 7512133; Nov. 6, 1975, 7512432

Int. Cl.[2] H02P *13/06;* H01F *29/04*

U.S. Cl. 323—43.5 R **3 Claims**



1. On-load tap-changer apparatus comprising two connection branches, each of said branches connected between a common connection point and a separate movable contact, one branch comprising a resistor in series with a first contact device and the other branch containing a vacuum element, each of said movable contacts being movable in succession between a number of fixed contacts intended for connection to the tappings of a regulating transformer, said second connection branch including a second contact device, said second contact device being connected directly in parallel with said vacuum element.

4,081,742

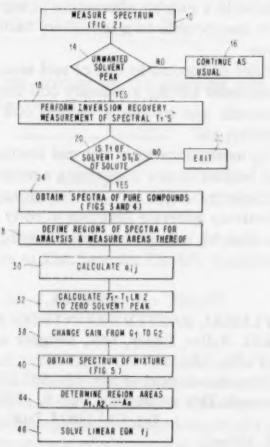
QUANTITATIVE ANALYSIS OF NUCLEAR MAGNETIC RESONANCE SPECTRA HAVING SOLVENT PEAKS

Donald C. Hofer; Vincent N. Kahwaty, both of Poughkeepsie, and Carl R. Valentino, Hopewell Junction, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 29, 1976, Ser. No. 755,271

Int. Cl.[2] G01R *33/00*

U.S. Cl. 324—.5 A **5 Claims**


MEASURE SPECTRUM (FIG 2)
UNWANTED SOLVENT PEAK
NO
CONTINUE AS USUAL
YES
PERFORM INVERSION RECOVERY MEASUREMENT OF SPECTRAL T1'S
IS T1 OF SOLVENT > 5% OF SOLUTE
NO
EXIT
YES
OBTAIN SPECTRA OF PURE COMPOUNDS (FIGS 3 AND 4)
DEFINE REGIONS OF SPECTRA FOR ANALYSIS & MEASURE AREAS THEREOF
CALCULATE aij
CALCULATE Fi=T1LN 2 TO ZERO SOLVENT PEAK
CHANGE GAIN FROM G1 TO G2
OBTAIN SPECTRUM OF MIXTURE (FIG 5)
DETERMINE REGION AREAS A1, A2, ---An
SOLVE LINEAR EQN fi

1. The method of quantitatively analyzing a mixture of two or more compounds through use of a pulsed FT NMR spectrometer having an adjustable variable gain, comprising the steps of:

forming a solution by dissolving said mixture in a solvent having a relaxation time substantially longer then the longest relaxation of any one of said compounds;

placing said solution in said spectrometer and pulsing said soluion with a 180°-τ-90° pulse sequence where τ is equal to the time at which said mixture is at equilibrium while said solvent is only partially relaxed so as to minimize any free induction decay signal from said solvent following said 90° pulse, to generate a spectrum wherein any spectral peak of said mixture is unobstructed by any spectral peak of said solvent, said pulse sequence being applied at a given gain G_A of said spectrometer;

dividing said spectrum into a number N of regions which number is at least as great as the number of compounds in said mixture and measuring the area A_i under each region i of said spectrum where i varies from 1 to N;

and solving a series of simultaneous equations of the form

$$A_i \frac{G_c}{G_A} = \sum_{j=1}^{N} a_{ij} f_j$$

where

a_{ij} is the area of spectral region i produced by a known concentration of compound j due to a gain G_c on said spectrometer,

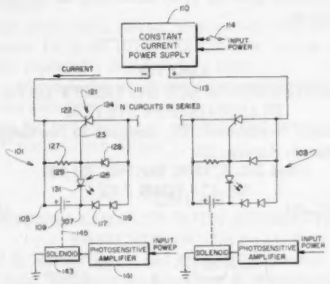
and f_j is the concentration of compound j to be found by solving said equations.

4,081,743

CELL DISCHARGE VOLTAGE MONITOR CIRCUIT FOR CELL CAPACITY GRADING AND METHOD FOR GRADING

James A. Madden, Gainesville, Fla., assignor to General Electric Company, Columbus, Ohio

Filed Aug. 13, 1976, Ser. No. 714,226
Int. Cl.² G01N 27/42
U.S. Cl. 324—29.5 **25 Claims**



1. A circuit for measuring the capacity of electrochemical cells comprising:

(a) a constant current power supply for estabilishing a discharge rate for the cell;

(b) a cellholder connected to said supply with negative and positive supply terminals connected to the positive and negative cellholder terminals so as to provide a discharge path for the cell, said discharge path including said constant current power supply;

(c) a switching means connectable in parallel with said holder for abruptly changing from a non-conductive to a conductive state responsive to the voltage of a cell disposed in said holder and providing a by-pass current path around said cell to thereby terminate discharge of a cell in said holder when said cell voltage attains a given value; and

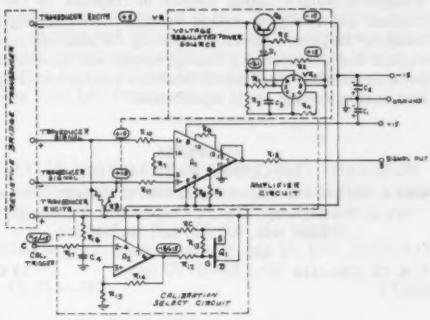
(d) means for indicating the termination of discharge of a cell in said holder.

4,081,744

RESISTANCE BRIDGE TRANSDUCER CONDITIONING CIRCUIT

David J. Ray, Albuquerque, N. Mex., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Nov. 10, 1976, Ser. No. 740,516
Int. Cl.² G01R 27/02
U.S. Cl. 324—63 **2 Claims**



1. A signal conditioning circuit for a resistance bridge transducer comprising

a voltage regulated power supply connected to supply DC power to the excitation terminals of said bridge transducer,

amplifier means connected to the signal output terminals of said bridge transducer,

a bridge calibration resistor, and

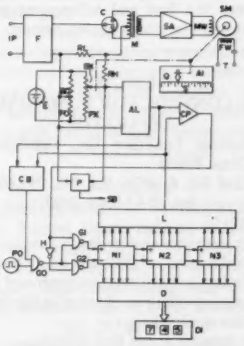
a calibration select circuit for selectively connecting said calibration resistor into and out of parallel relationship with one arm of said resistance bridge transducer said calibration select circuit comprising a field effect transistor connected in series with said calibration resistor between two adjacent resistance bridge tranducer terminals, and an operational amplifier connected to turn said field effect transistor on and off in response to positive and negative DC control signals.

4,081,745

DIGITAL-ANALOG INDICATING SYSTEM

Soichiro Yasunaga, 2-28, Denenchofu, Ohta, Tokyo, Japan

Filed Mar. 23, 1976, Ser. No. 669,517
Claims priority, application Japan, Dec. 23, 1975, 50-173176
Int. Cl.² G01R 17/06
U.S. Cl. 324—99 R **7 Claims**



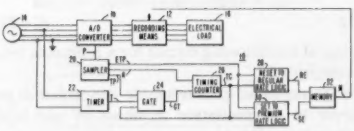
1. A method of producing corresponding digital and analog

indications of an unknown input voltage comprising the steps of applying the unknown voltage across an initially balanced potentiometer including an adjustable slider, adjusting the position of such slider to restore the potentiometer to a balanced condition while quantitatively indicating the magnitude of such adjustment to thus provide an analog indication of the unknown voltage corresponding to the extent of such adjustment, measuring the absolute value of the potential existing across the potentiometer, initiating a flow of pulses to a pulse counter in response to a change in the absolute measured voltage, driving a digital display in response to the pulse counter, generating an analog voltage corresponding to the count in the pulse counter, comparing the absolute measured voltage and the generated analog voltage and terminating the pulse count when the absolute measured voltage and the generated analog voltage are in equilibrium.

4,081,746
MULTIPLE RATE METER

Carl J. Snyder, and Milton Blick, both of Raleigh, N.C., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Nov. 6, 1975, Ser. No. 629,266
Int. Cl.[2] G01R *15/08*
U.S. Cl. 324—116 **13 Claims**



1. a multiple rate meter system for totalizing electrical power usage of electrical energy supplied to a load, comprising:

first means producing pulses spaced in time proportional to the rate of usage of the electrical energy, wherein each pulse represents a prededetermined quantity of electrical energy and successively reoccurring groups of identical numbers of said pulses each represent a corresponding larger quantity of electrical energy,

second means initiating time signals defining a predetermined timing period in response to a first pulse of each of the pulse groups produced by said first means, said predetermined timing period corresponding to a predetermined value of kilowatt power usage directly related to the time intervals of said pulses,

and third means responsive to said first pulse of said first means and said time signals of said second means, said third means including totalizing means for totalizing the power usage in a first predetermined manner when the time between said first pulse and a predetermined subsequent pulse in each of the pulse groups produced by said first means exceeds said predetermined timing period, and totalizing in a second predetermined manner when the time between the first and subsequent pulses does not exceed said predetermined timing period.

4,081,747
REMOTE CONTROL FOR COMMUNICATION APPARATUS

George M. Meyerle, Lakeview Dr., Candlewood Orchards, Brookfield, Conn. 06804

Filed Jul. 6, 1976, Ser. No. 702,694
Int. Cl.[2] H04B *7/00*
U.S. Cl. 325—37 **2 Claims**

1. In a communication system for transmitting intelligence occurring within a band of frequencies f_b between first and second remotely located stations, an improved remote control arrangement for controlling an element at the first station from the second station comprising:

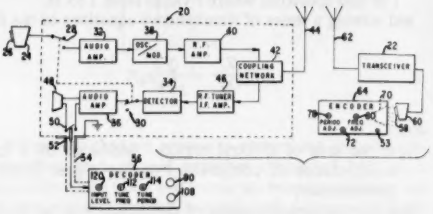
A. a decoder located at the first station;

B. an encoder located at the second station;

C. said encoder having means for generating a control signal of preselected frquency f_c which occurs for a preselected interval of time T_c and for selectively varying the frequency f_c over a range of frequencies lying in the band of frequencies f_b and selectively varying the interval of time T_c;

D. said decoder including means for detecting the reception of a signal of preselected frequency f_c and preselected interval T_c and for discriminating against signals of other frequencies and intervals;

E. said arrangement including adjustable circuit means at said first station for tuning said decoder to be selectively responsive to a frequency f_c and adjustable circuit means for tuning said decoder to be selectively responsive to the interval T_c;



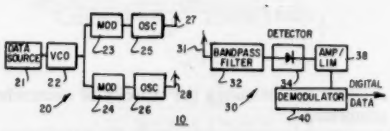
F. said arrangement including a transceiver located at said first station and communication apparatus located at said second station for communicating between said first and second stations, said transceiver being adapted for providing a detected signal representative of received intelligence and said decoder including means for coupling the detected signal from said transceiver to said decoder; and

G. said decoder including circuit means for generating a window signal which is timed with respect to the interval T_c and means for sensing coincidence in time between the occurrence of the window signal and termination of the control signal interval T_c for activating an element at said first station.

4,081,748
FREQUENCY/SPACE DIVERSITY DATA TRANSMISSION SYSTEM

James E. Batz, Northbrook, Ill., assignor to Northern Illinois Gas Company, Aurora, Ill.

Filed Jul. 1, 1976, Ser. No. 701,901
Int. Cl.[2] H04B *7/02*
U.S. Cl. 325—56 **13 Claims**



1. In a diversity data transmission system, transmitter means including data source means having means for providing digital signals coded to represent information to be transmitted, and signal means responsive to said digital signals provide output signals at different predetermined frequencies coded to represent said information, at least first and second carrier signal generating means operable to provide carrier signals at respective first and second frequencies, modulating means responsive to said output signals for providing modulating signals at said predetermined frequencies for modulating said first and second carrier signals with the same information to provide first and second modulated carrier signals for transmission to a receiving location, and receiver means at said receiving location including input means for receiving the first and

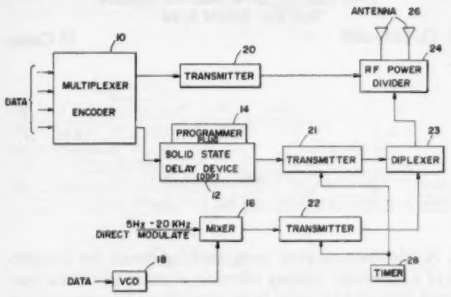
second modulated carrier signals transmitted by said transmitter means, detector means responsive to said first and second modulated carrier signals to provide signals at the frequencies of said modulating signals and their sidebands, amplifier/limiter means connected to an output of said detector means for passing onlysaid modulating signals and their sidebands, and demodulator means connected to an output of said amplifier/limiter means and responsive only to signals at the frequencies of said modulating signals to provide digital signals representing said information.

4,081,749

RE-ENTRY TELEMETRY SYSTEM

Karl F. Peterson, Saratoga, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 18, 1976, Ser. No. 733,663
Int. Cl.[2] H03K 7/02
U.S. Cl. 325—113 **3 Claims**



1. A re-entry telemetry system comprising:

means for converting input data to an output pulse code modulated (PCM) bit stream;

a first means for RF transmitting said output PCM bit stream;

a solid state delay device to store selected data from said output PCM bit stream, and then to output said selected data repeatedly at a faster bit rate;

a second means for RF transmitting said selected data output from said delay device; and

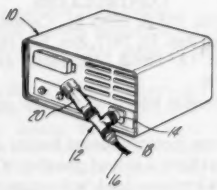
means for combining and radiating the outputs of said two RF transmitting means.

4,081,750

ANTENNA COUPLER WITH AUTOMATICALLY SWITCHED DUMMY LOAD

Ronald P. Herr, Warren, and Kenneth W. Maurin, Fraser, both of Mich., assignors to Ken-Herr & Associates, Southfield, Mich.

Filed Jan. 28, 1977, Ser. No. 763,364
Int. Cl.[2] H04B 1/02
U.S. Cl. 325—150 **8 Claims**



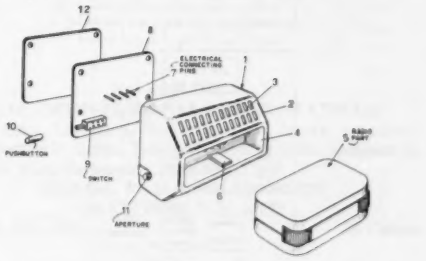
1. An adapter device for electrically connecting an antenna to a radio transmitter unit, with the radio transmitter unit being of the type provided with an output jack for coupling said antenna to said radio transmitter unit, the device comprising: an adapter assembly including a first coupling means adapted to electrically connect said adapter assembly to said transmitter antenna output jack; second coupling means adapted to mate with an antenna coupling; resistive load means impedance related to said radio transmitter unit output to prevent overload thereof when electrically connected thereto; switching means operated by mating of said antenna coupling with said second coupling means to electrically connect alternatively said resistive load means or said second coupling means to said transmitter output jack via said first coupling means, upon disconnection or connection of said antenna coupling, respectively, whereby said resistive load is automatically electrically connected to said radio transmitter unit output to protect said transmitter means output stage upon disconnection of said antenna from said device.

4,081,751

PLUG-IN RADIO SET, AND SUPPORT THEREFOR

Ciro Maddaloni, Rome, Italy, assignor to Voxson S.p.A., Rome, Italy

Filed Jun. 29, 1976, Ser. No. 701,048
Claims priority, application Italy, Jul. 25, 1975, 50674 A/75
Int. Cl.[2] H04B 1/08
U.S. Cl. 325—312 **2 Claims**



1. A car radio set comprising a stationary first radio part and removable second radio part;

said stationary first radio part being fastened to the car and including a rear plate, a base plate and a front casing;

said rear plate carrying connection means for connecting said first radio part with an antenna, connection means for connecting said first radio part with a power supply, and connection means for connecting said first radio part with at least one loud-speaker;

said base plate carrying a plurality of connection plugs and a switch means;

said front casing having a plurality of openings for receiving said plurality of plugs, a push button arranged to operate said switch means, and a recess adapted to receive said second radio part;

said removable second radio part including connecting sockets for receiving and making electrical contact with said plugs, electronic radio circuitry, volume and tuning control means and a frequency indicator, whereby said removable second part is rendered operative only when inserted in said recess of said stationary first part.

4,081,752

DIGITAL FREQUENCY SYNTHESIZER RECEIVER

Yasuaki Sumi, Tottori, Japan, assignor to Sanyo Electric Co., Ltd. and Tottori Sanyo Electric Co., Ltd., both of, Japan

Filed May 13, 1976, Ser. No. 686,214
Claims priority, application Japan, May 30, 1975, 50-65939; May 30, 1975, 50-65941; Jun. 9, 1975, 50-69840
Int. Cl.[2] H04B 1/32
U.S. Cl. 325—335 **39 Claims**

1. A superheterodyne receive, comprising means for receiv-

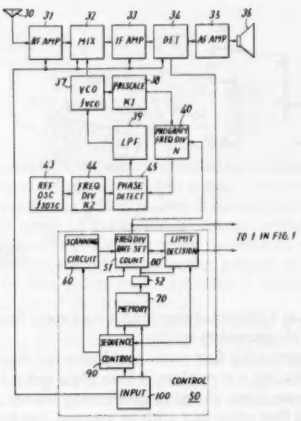
ing a high frequency signal, local oscillating means for providing an oscillation frequency signal the frequency of which is different by a given frequency difference from said received high frequency signal and mixing means responsive to said received high frequency signal and said local oscillation frequency signal for providing an intermediate frequency signal; said local oscillating means comprising

voltage controlled oscillating means for providing said oscillation frequency signal the oscillation frequency of which is variable as a function of a given control voltage,

means for modifying the oscillation frequency of the output from said voltage controlled oscillating means,

means for controlling the rate of frequency modification of said oscillation frequency modifying means, and

means responsive to the output from said oscillation frequency modifying means, as modified at the frequency modification rate controlled by said frequency modification rate controlling means, for providing a control voltage associated with the frequency of the output from said oscillation frequency modifying means to said voltage controlled oscillating means, whereby said local oscillating means is adapted to provide a local oscillation frequency signal the frequency of which is associated with the frequency modification rate, as controlled by said frequency modification rate controlling means, said receiver further comprising,



means for inputting information concerning the manner of controlling the frequency modification rate by said frequency modification rate controlling means,

means responsive to the information inputted by said inputting means for controlling sequentially the manner of controlling said frequency modification rate by said frequency modification rate controlling means,

said sequential control means comprising means for generating timing signals, and means responsive to the information inputted by said inputting means and said timing signals obtainable from said timing signal generating means for providing a sequential control signal in synchronism with said timing signals, said timing signal generating means being adapted to be actuated in response to the information inputted by said inputting means,

means responsive to said inputting means for accommodating the control of frequency modification rate by said frequency modification rate controling means for enabling reception of the frequencies in a given receiving frequency range,

means for providing a signal representative of the tuning state by said receiver, and

means for commanding a scanning operation by said receiver,

said frequency modification rate controlling means comprising means responsive to said commond output from said scanning operation commanding means to be enabled to make variation of the frequency modification rate in a given direction and responsive to said signal representative of the tuning state by state receiver to be disabled, thereby to discontinue the variation of said frequency modification rate,

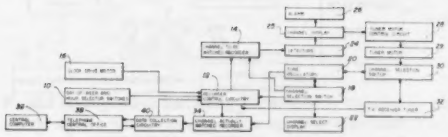
said accommodating means comprising means for storing information concerning said given receiving frequency range, and means operatively coupled to said information storing means for controlling the variation range of said frequency modification rate variation means with said information concerning said given receiving frequency range.

4,081,753

AUTOMATIC PROGRAMMING SYSTEM FOR TELEVISION RECEIVERS

Arthur O. Miller, 10141 Chesterton Dr., Dallas, Tex. 75238

Filed Dec. 13, 1976, Ser. No. 750,000
Int. Cl.[2] H04N 5/44
U.S. Cl. 325—396 **15 Claims**



1. A television receiver programming device for preselection of a television viewing schedule of preselected time periods and television channels to be viewed by a television viewer at a subsequent time comprising:

first switch means for programming a preselected time period;

second switch means for programming a preselected one of a plurality of television channels for viewing at said preselected time period;

recording means including a recording medium and a drive means for driving said medium interconnected to said first and second switch means;

said first switch means being operable to actuate said drive means;

means for generating a plurality of unique code signals; and

said second switch means being operable to select and apply ones of said plurality of unique code signals to said recording medium wherein said selected ones of said plurality of unique code signals correspond to said preselected one of said plurality of television channels, such that by operation of said first and second switch means, said recording means generates a record on said recording medium of the preselected television viewing schedule.

4,081,754

PROGRAMMABLE TELEVISION RECEIVER CONTROLLERS

Joseph N. Jackson, 533 E. 169th St., Carson, Calif. 90746

Filed Jan. 31, 1977, Ser. No. 764,032
Int. Cl.[2] H04B 1/16; H01H 43/00
U.S. Cl. 325—396 **10 Claims**

1. A programmable television receiver controller comprising:

a random access memory means having a first plurality of address input lines, a second plurality of data input/output lines, and at least one read/write control line;

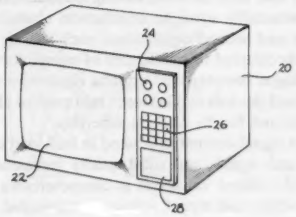
clock means for providing a plurality of time dependent output signals in a given format;

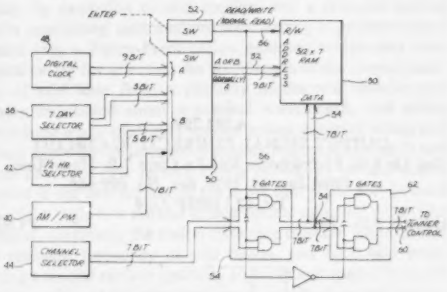
control means input/output to said date output lines for controlling channel selection on a television receiver in

response memory output signals on said data input/output lines and a read condition on said control line.

first program means for manually selecting a future time period, and for providing a plurality of time programming output signals equal in number to said first plurality of address input lines of said memory means and of the same format as the output signals of said clock means;

second program means for manually making a future channel selection corresponding to said future time period selected on said first program means, and for providing a





plurality of channel programming output signals coupled to said data input/output lines of said memory means; and

channel selection entry means for coupling said clock means to said address input lines when reading memory output signals or said first program means to said address lines when writing into said memory means for programming said memory means at address locations determined by said first program means with channel selections manually determined by said second program means when a write condition is provided on said control line.

4,081,755

BAUD RATE GENERATOR UTILIZING SINGLE CLOCK SOURCE

James J. Howard, Parsippany, N.J., assignor to Litton Business Systems, Inc., Morris Plains, N.J.

Filed Aug. 10, 1976, Ser. No. 713,101
Int. Cl.[2] H03K *21/00, 23/06*
U.S. Cl. 328—41 **4 Claims**

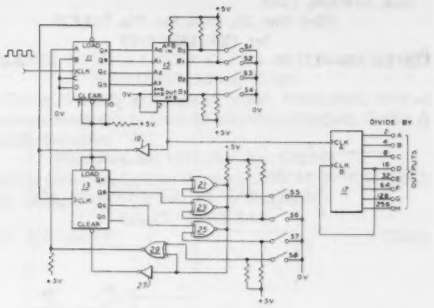
1. A clock rate generator comprising;

a first synchronous counter means having clock input, load input, data input and clear input terminals and output terminals,

a second synchronous counter means having clock input, load input, clear input, and output terminals,

first comparator means, having its input coupled to the output of said first synchronous counter means, and its output coupled to the clock input of said second synchronous counter means and to the load input of said first synchronous counter means, and

second comparator means, having its input coupled to the output of said second synchronous counter means and its output coupled to a data input of said first synchronous counter means and to the clear input of said second synchronous counter means,



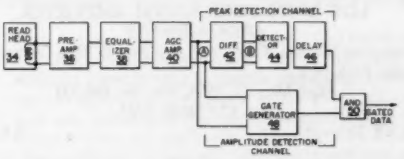
said second synchronous counter means load input terminal being connected to said first synchronous counter means clear terminal.

4,081,756

DUAL CHANNEL SIGNAL DETECTOR CIRCUIT

Robert Price, Lexington, Mass.; George V. Jacoby, Los Altos, and Arthur P. Geffon, Sunnyvale, both of Calif., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Dec. 30, 1976, Ser. No. 755,875
Int. Cl.[2] H03K *5/20, 5/153*
U.S. Cl. 328—117 **21 Claims**



1. A dual channel signal detector circuit for detecting data in an input signal applied to said circuit, comprising:

equalizer means for transforming a variable peak amplitude input signal having data representative pulse peaks into a substantially constant peak amplitude output signal having even-symmetric data representative pulses each corresponding to a respective pulse of the input signal, where each data representative pulse is narrowed in time relative to the corresponding input pulse and substantially flat at the baseline on each side beyond the baseline touching points and has an amplitude spectrum contained with a limited frequency range,

peak detection channel means coupled to said equalization means for producing a data pulse indicative of the peak of each data rperesentative pulse of the output signal of said equalizer means,

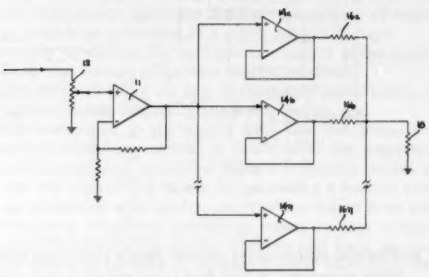
amplitude detection channel means coupled to said equalization means for producing a gating pulse corresponding to each data representative pulse of the output signal of said equalizer means, and

means coupled to receive the data pulses and getting pulses and respond to each data pulse occurring in time coincidence with a gating pulse for gating the data pulses to an output terminal of said circuit.

4,081,757
PARALLEL POWER AMPLIFIER CIRCUITS

Paul S. Rumbaugh, Santa Ana, Calif., assignor to Altec Corporation, Anaheim, Calif.

Filed Nov. 19, 1976, Ser. No. 743,525
Int. Cl.[2] H03F 3/68
U.S. Cl. 330—124 R 3 Claims

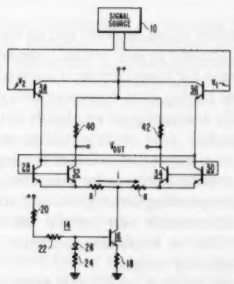


1. An amplifier for providing power to a load comprising:
a voltage amplifier circuit;
a plurality of similar power amplifier circuits connected in parallel with each other between the voltage amplifier circuit and the load, each of said circuits being connected in a closed loop configuration to have unity voltage gain, and
a similar ballasting resistor connected between the output of each of the power amplifier circuits and the load, the resistance of said resistors being such as to provide substantially equal sharing of the load between said power amplifier circuits even with substantially different open loop gains in the amplifier circuits.

4,081,758
LOW DISTORTION SIGNAL AMPLIFIER ARRANGEMENT

Steven Alan Steckler, Clark, N.J., assignor to RCA Corporation, New York, N.Y.

Filed May 27, 1976, Ser. No. 690,721
Int. Cl.[2] H03F 3/45
U.S. Cl. 330—252 6 Claims

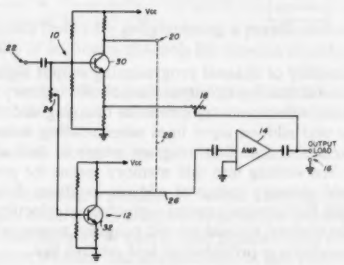


1. A signal amplifier arrangement comprising:
a first circuit path for providing a direct operating current;
a first differential amplifier circuit comprising first and second semiconductor devices, each having a main current conduction path coupled to said first direct current circuit path and each having a control electrode;
an output differential amplifier circuit comprising third and fourth semiconductor devices, each having a main current conduction path coupled to said first direct current circuit path and each having a control electrode direct current coupled respectively to control electrodes of said first and second devices;
at least a first output load circuit coupled to a main current conduction path of one of said third and fourth devices at a point remote from said coupling to said first direct current providing circuit path;
a source of signals to be amplified;
means comprising fifth and sixth semiconductor devices having main current conduction paths coupled respectively to said main current conduction paths of said second and first devices, having conduction characteristics substantially equal to conduction characteristics of said first and second devices and each having a control electrode coupled to said source of signals for coupling signal voltages between said control electrodes of said first and second devices and between said control electrodes of said third and fourth devices; whereby
output signal current produced in said load circuit is related to said signals and substantially independent of current level induced variations in characteristics of said devices to which said signal voltages are coupled.

4,081,759
OUTPUT SIGNAL CORRECTING CIRCUIT

Wai Lit Yen, 92 Pokfulam Rd., La Clare 7-B, Hong Kong

Filed Jun. 24, 1976, Ser. No. 699,648
Int. Cl.[2] H03F 1/34
U.S. Cl. 330—295 3 Claims

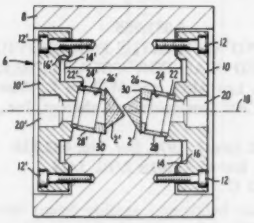


1. A circuit for correcting the AC output signal from an electronic device which responds to a variable input signal, such as an amplifier, the circuit comprising:
first and second amplifiers with the input of the first directly receiving the AC portion of the input signal;
a variable input resistance with one end attached to the input of the first amplifier and the other end attached to the input of the second amplifier;
means for combining the output signals from the first and second amplifiers and for providing the combined AC signals to the electronic device; and
variable resistance feedback means for providing a selected portion of the AC output signal from the electronic device to the first amplifier only, said feedback means changing the signal from the first amplifier as a function of the difference between the input signal and the output signal, whereby the output signal from the electronic device in response to the combined signals from the first and second amplifiers more closely corresponds to the input signal than would the output signal from the electronic device if the electronic device received the input signal directly.

4,081,760
ETALON LASER MODE SELECTOR

Anthony D. Berg, Los Altos, Calif., assignor to Coherent, Inc., Palo Alto, Calif.

Filed Jun. 3, 1976, Ser. No. 692,537
Int. Cl.[2] H01S *3/082, 3/086, 3/10*; 331 *94.5 C;94.5 D;94.5 G;94.5 K;94.5 L;94.5 M;94.5 S*
U.S. Cl. 331—94.5 C 9 Claims

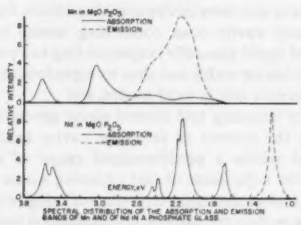


1. In combination with a laser having a lasing medium, means for excitation of said medium and a resonant optical cavity containing said medium and having a predetermined optical axis, a Fabry-Perot etalon mounted within said laser optical cavity for selecting the wavelength of the output radiation of said laser from a plurality of discrete wavelengths closely distributed about a nominal wavelength, said etalon comprising a pair of closely spaced prisms mounted along said optical axis with the laser beam passing therethrough, each said prism having a first surface facing outwardly of said etalon parallel to the first surface of the other said prism and inclined at a slight angle to a normal to said optical axis, said prism first surfaces comprising the etalon reflecting surfaces which define the resonant frequency of said etalon, and each said prism having a second surface optically adjacent and spaced from the second surface of the other said prism, each said second surface being inclined relative to its respective first surface, whereby the etalon may possess the low walk-off loss characteristics of a thick, solid etalon while having the capability of readily adjustable spacing between the etalon reflecting surfaces to facilitate tuning of the etalon.

4,081,761
ENHANCED LASER PUMPING BY AUXILIARY LUMINESCENT CENTERS THAT ABSORB AND TRANSFER NORMALLY WASTED PUMP ENERGY TO THE LASER ION

Nathan T. Melamed, Pittsburgh, and Chikara Hirayama, Murrysville, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 11, 1969, Ser. No. 852,966
Int. Cl.[2] H01S *3/17*
U.S. Cl. 331—94.5 E 10 Claims



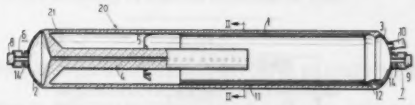
SPECTRAL DISTRIBUTION OF THE ABSORPTION AND EMISSION BANDS OF Mn AND OF Nd IN A PHOSPHATE GLASS

1. A laser medium comprising a host, a Nd^{+3} activator ion capable of laser action in the host and a sensitizer ion in said medium capable of absorbing and transferring energy to the activator ion, the sensitizer selected from the group of ions consisting of Mn^{+2} and UO_2^{+2}.

4,081,762
GAS LASER WITH A LASER CAPILLARY POSITIONED IN A DISCHARGE TUBE

Hans Golser, Munich, and Helmut Kindl, Westerham, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Nov. 14, 1975, Ser. No. 632,014
Claims priority, application Germany, Feb. 18, 1975, 2506842; Feb. 18, 1975, 754887[U]; Feb. 18, 1975, 2506707
Int. Cl.[2] H01S *3/00*
U.S. Cl. 331—94.5 G 5 Claims



1. In a gas laser having a vacuum-tight discharge tube, a laser capillary having at least a part of its length positioned in the interior of the discharge tube and in communication therewith, said laser having an anode, a cathode and means for producing electrical discharge therebetween and in the laser capillary, and said laser having two mirror members forming an optical resonator, the improvement which comprises in combination:

(A) an envelope assembly consisting of
  (1) an elongated cylindrical tube consisting of a first glass and having an envelope axis,
  (2) two end caps, each one consisting of a first metal, each one disposed across a different end of said tube and sealingly fused thereto in regions of contact, and each one having an aperture defined therein about said envelope axis, one of said end caps having an exhaust tube means functionally associated therewith,
  (3) the coefficient of thermal expansion of said first glass being about equal to the coefficient of thermal expansion of said first metal,

(B) two mirror members, each one consisting of a second glass,

(C) two tubular members each one having a tube axis, and each one consisting of a second metal, and including first solder means sealingly engaging one end of each one of said tubular members to a different one of said end caps over said aperture thereof with said tubular members being so oriented spatially that their respective said tube axes are generally coaxial with each other and with said envelope axis, and second solder means sealingly engaging the opposite end of each one of said tubular members to a different one of said mirror members,

(D) the coefficient of thermal expansion of said second glass being about equal to the thermal coefficient of expansion of said second metal,

(E) an elongated glass capillary tube member having at one end thereof a funnel-shaped configuration which is fused to the inside of said tube adjacent one of said end caps, and having the other end thereof terminate beyond the middle of said tube, and including a support member, said support member being disposed radially between said capillary tube member and said tube and consisting of a heat hardinable metal spring alloy, and

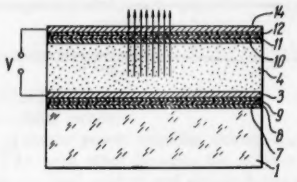
(F) an aluminum sheet member disposed adjacent the other one of said end caps circumferentially inside said tube and

yieldingly biased adjacent the walls thereof, said sheet member having longitudinally extending overlapping marginal edge portions, and including electrical connector means joining said sheet member to said other end cap, said sheet member surrounding the terminal portion of said capillary tube.

4,081,763
ELECTROLUMINESCENT LASER

Natalya Andreevna Vlasenko, ulitsa Entuziastov 15, kv. 175, and Zhanneta Alexandrovna Pukhly, bulvar Druzhby Narodov, 3b, Kv. 79, both of Kiev, U.S.S.R.

Continuation of Ser. No. 320,926, Jan. 4, 1973, abandoned. This application Jan. 19, 1977, Ser. No. 760,581
Int. Cl.² H01S *3/00*
U.S. Cl. 331—94.5 H **3 Claims**



1. A solid-state laser with a Fabry-Perot cavity in which an inverted population is formed at the levels of dope ions which are elements having unfilled electron shells by means of impact excitation of said ions with carriers accelerated by an electric field, made on the basis of an electroluminescent capacitor and comprising:

an active element, which is a layer of an electroluminescent substance of said capacitor; which is optically homogeneous and doped with said elements having unfilled electron shells;

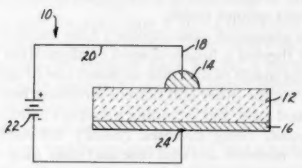
electrodes for said capacitor, between which said active element is disposed, said electrodes being intended to form an electric excitation field of said active element;

said electrodes being simultaneously the mirrors of a Fabry-Perot cavity, one of said electrode mirrors being partially transparent to the laser emission, a voltage being applied to said electrodes, wherein the active element is a powder placed in an immersion medium which is a dielectric transparent to the laser emission whose refractive index is equal to that of the powder.

4,081,764
ZINC OXIDE LIGHT EMITTING DIODE

Marvin H. Christmann, Afton Township, Washington County, Minn.; Richard L. Weiher, Hudson Township, St. Croix County, Wis., and William C. Tait, Oak Park Heights, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 296,837, Oct. 12, 1972, abandoned. This application Sep. 10, 1973, Ser. No. 396,003
Int. Cl.² H01L *33/00*
U.S. Cl. 331—94.5 H **18 Claims**

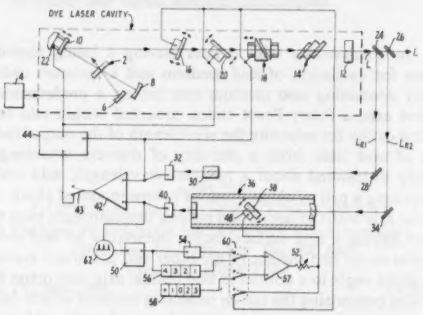


1. A light emitting diode comprising a crystal of high efficiency violet fluorescing zinc oxide, a substantially ohmic cathode secured to a portion of the crystal and a rectifying anode secured to another portion of the crystal, which diode emits light at room temperature when a low electrical potential is applied across said cathode and anode, wherein the zinc oxide crystal is a thin z-cut slab sectioned from a single crystalline boule and wherein the rectifying anode is secured to an oxygen face of said slab.

4,081,765
METHOD AND APPARATUS FOR PROVIDING A CALIBRATED SCAN FOR A SCANNING LASER

Anthony D. Berg, Los Altos, and William L. Wise, Mountain View, both of Calif., assignors to Coherent, Inc., Palo Alto, Calif.

Filed Jun. 3, 1976, Ser. No. 692,533
Int. Cl.² H01S *3/10, 3/13*
U.S. Cl. 331—94.5 C **11 Claims**



1. In a scanning laser system including a broadband laser tunable over a range of selected output radiation frequencies and a reference cavity receiving a portion of the output radiation of said laser and having a predetermined spacing between natural resonant frequencies, means for continuously varying the output radiation frequency of said laser about a selected nominal output radiation frequency with a calibrated scan, comprising

adjustable scanning means associated with said reference cavity for varying the resonant frequency of said reference cavity,

adjustable signal generating means for controlling the scan of said reference cavity scanning means,

means displaying resonant frequency axial modes of said reference cavity as a function of said scan width,

selectively operable means within the cavity of said laser for scanning the output radiation frequency of said laser under the control of said reference cavity scanning means,

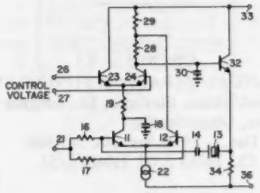
means, operable while said laser is being operated at said selected nominal output radiation frequency without operation of said laser cavity scanning means, for setting said reference cavity scan controlling means to provide a control signal generally corresponding to a predetermined nominal scan width and thus to a predetermined number of reference cavity axial modes, and

means for adjusting said control signal generating means to adjust the number of reference cavity axial modes displayed within a predetermined range of said display, whereby adjustment of said adjusting means to place the exact said predetermined number of reference cavity axial modes within the display predetermined range serves to calibrate the scan controlling signal and thus the scan of the reference cavity scanning means for an incremental frequency scan at such laser nominal output radiation frequency.

4,081,766
CRYSTAL TUNED VOLTAGE CONTROLLED OSCILLATOR

Michael John Gay, Geneva, Switzerland, assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 24, 1977, Ser. No. 761,551
Int. Cl.² H03B *5/36*
U.S. Cl. 331—116 R **5 Claims**

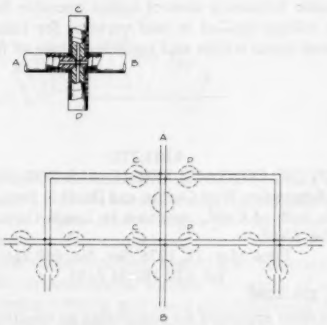


4. A crystal tuned voltage controlled oscillator having a crystal, comprising: a first differential amplifier having an input and a first and second output, the input being adapted for coupling to the crystal; first means for phase shifting the first output; means for providing a current source for the first differential amplifier; a second differential amplifier having an input and an output, the input being adapted for receiving a control voltage; second means for phase shifting the output of the second differential amplifier, the first and second differential amplifiers being coupled to allow the first means for phase shifting to serve as a current source for the second differential amplifier so that a portion of any signal phase shifted by the first means for phase shifting is also phase shifted by the second means for phase shifting and the second output of the first differential amplifier is connected directly to the second means for phase shifting; and an amplifier coupled to the output of the second differential amplifier and having an output for coupling with the crystal, whereby amount of phase shift to the output of the second differential amplifier can be controlled by the control voltage.

4,081,767
DOUBLE-STUB TRANSMISSION LINE ELEMENTS IN COMMUNICATION NETWORKS

William B. Voss, 387 N. Kenter Ave., Los Angeles, Calif. 90049

Continuation-in-part of Ser. No. 639,008, Dec. 8, 1975, abandoned. This application Mar. 14, 1977, Ser. No. 777,395
Int. Cl.² H01P *1/10, 5/12*
U.S. Cl. 333—7 R **7 Claims**



1. A high-frequency electrical signal transmission-line network comprising multiple double-stub elements connected on a main transmission line, each said element containing two short stubs, both being open at their distant ends, being of exactly equal lengths, being of the same characteristic impedance as the main line, and attached structurally and electrically at a single station on the main line in such a manner that at the resulting stub junction each of the two stubs and the single outgoing portion of the same main line present an equal impedance, in parallel form, to the incoming portion of said main line;

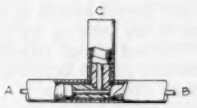
the spacing between said double-stub elements being unrestricted for lines carrying pulsed signals, being unrestricted also for lines which carry CW signals and in which the said stubs are sufficiently short to avoid rereflection of signal waves, but, on the other hand, said spacing being restricted to a distance of $(K+\frac{1}{2})\lambda$ for all remaining lines carrying CW signals, λ being the carrier signal wavelength and K being any integer;

said double-stud elements substantially eliminating ringing and overshoot and substantially reducing remaining distortion and forward-going power losses in pulsed wavefronts traveling in stubbed transmission lines.

4,081,768
SINGLE-STUB TRANSMISSION LINE ELEMENTS IN COMMUNICATION NETWORKS

William B. Voss, 387 N. Kenter Ave., Los Angeles, Calif. 90049, and Renne S. Julian, 16037 Anoka Dr., Pacific Palisades, Calif. 90272

Continuation-in-part of Ser. No. 639,009, Dec. 9, 1975, abandoned. This application Mar. 14, 1977, Ser. No. 777,394
Int. Cl.² H01P *5/12*
U.S. Cl. 333—9 **4 Claims**



1. A high frequency electrical signal transmission-line network comprising multiple single-stub elements connected on a main transmission line, each said element containing one short stub which is open at its distant end, the characteristic impedance of said stub being one-half of that of the said main line, said stub being attached structurally and electrically to the said main line in such a manner that at the resulting stub junction the said stub presents half the impedance of, and the outgoing portion of the said main line presents an equal impedance to, the incoming portion of the said main line;

the spacing between said single-stub elements being unrestricted for lines carrying pulsed signals, being unrestricted also for lines which carry CW signals and in which the said stubs are sufficiently short to avoid rereflection of signal waves, but, on the other hand, said spacing being restricted to a distance of $(K+\frac{1}{2})\lambda$ for all remaining lines carrying CW signals, λ being the carrier signal wavelength and K being any integer;

said single-stub elements substantially eliminating ringing and overshoot and substantially reducing remaining distortion and forward-going power losses in pulsed wavefronts traveling in stubbed transmission lines.

4,081,769
ACOUSTIC SURFACE WAVE RESONATOR WITH SUPPRESSED DIRECT COUPLED RESPONSE

William Robert Shreve, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

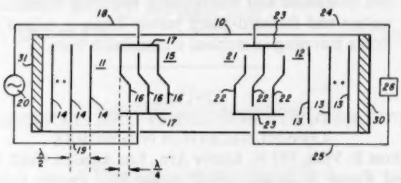
Filed Sep. 13, 1976, Ser. No. 723,008
Int. Cl.² H03H *9/04, 9/26, 9/32;* **H01L** *41/10*
U.S. Cl. 333—72 **14 Claims**

1. An acoustic surface wave resonator device comprising: substrate means having at least a surface of piezoelectric

material on which acoustic surface waves may be propagated,

first and second means on said substrate means for reflecting acoustic surface waves propagating thereon, said second reflecting means being disposed a predetermined distance from said first reflecting means so as to define a cavity therebetween for supporting a standing wave at a resonant frequency,

input and output interdigital transducer means for electric to acoustic conversion at the input transducer means and acoustic to electric conversion at the output transducer means, said input and output transducer means being disposed on said substrate means in the cavity between said first and second reflecting means,



each of said input and output transducer means including respective sets of opposed conductive transducer pads, and a plurality of interdigitated electrode finger means alternately originating from one and the other of the set of conductive transducer pads, and

each of said pluralities of interdigitated electrode finger means of said input and output transducer means including at least a portion thereof located at a position centered upon the peak of the standing wave to be established between said first and second reflecting means and an integral intermediate portion located in offset relationship to the peak of the standing wave.

4,081,770

CAPACITIVE ELECTRIC FILTER

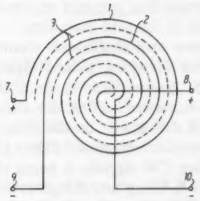
Ferdy Mayer, 18 rue Thiers, 38000 Grenoble, France

Continuation-in-part of Ser. No. 628,914, Nov. 5, 1975, abandoned, which is a continuation of Ser. No. 518,729, Oct. 29, 1974, abandoned. This application Apr. 28, 1976, Ser. No. 681,043

Claims priority, application France, Oct. 29, 1973, 73 38507

Int. Cl.[2] H03H *7/04, 7/14;* **H01G** *4/32, 1/147*

U.S. Cl. 333—79 **3 Claims**



1. An electric filter comprising:

a first conducting strip,

a second conducting strip,

a first dielectric strip,

a second dielectric strip,

the first and second conducting strips being rolled up together and separated by the dielectric strips, the first conducting strip overlapping the same width of the second conducting strip throughout,

a first terminal,

a second terminal,

a third terminal,

one end or a point close to it of the first conducting strip being connected to the first terminal and the other end or a point close to it of the first conducting strip being connected to the second terminal so that a substantial part of the inductance of the first conducting strip due to its being rolled up is in series with the first and second terminals,

the third terminal being connected to the second conducting strip at one point substantially at the middle of the second conducting strip.

4,081,771

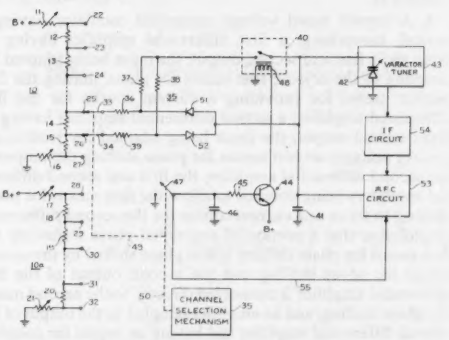
82 DETENT MANUAL VARACTOR TUNING SYSTEM

Melvin Carlyle Hendrickson, Elmhurst, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

Filed Dec. 6, 1976, Ser. No. 747,580

Int. Cl.[2] H03J *5/06;* **H04N** *5/52*

U.S. Cl. 334—15 **16 Claims**



1. A television receiver tuner comprising:

tuning means including at least one varactor as the frequency determining element thereof;

means simultaneously developing a plurality of nominal tuning voltages for selective application to said varactor for tuning a desired television channel;

means for decoupling said tuning voltage developing means from said varactor while confining the voltage applied thereto to a range of voltages including the nominal tuning voltage corresponding to said desired channel, said range of voltages defining a restricted range of frequencies within said desired television channel; and

automatic frequency control means operable for adjusting the voltage applied to said varactor for tuning to a received signal within said restricted range of frequencies.

4,081,772

MOVING CONTACT TERMINALS FOR RELAYS

John C. Schuessler, West Covina, and David J. Tapp, Manhattan Beach, both of Calif., assignors to Leach Corporation, Los Angeles, Calif.

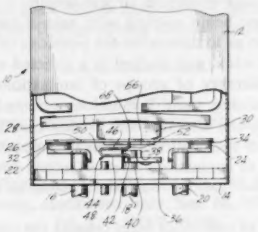
Filed Mar. 22, 1976, Ser. No. 669,214

Int. Cl.[2] H01H *1/50*

U.S. Cl. 335—200 **5 Claims**

1. In a relay apparatus for completing an electrical circuit to the moving contacts supported on a pivoted contact blade means comprising a header having at least one connector pin extending therethrough, an E-shaped bracket having the center leg attached to and supported by the connector pin, the outer legs extending perpendicular to the pin on either side, and a U-shaped spring member having one leg bifurcated with the ends turned outwardly, the outwardly turned ends engag-

ing the outer legs of the E-shaped bracket on either side of the pin, the outer leg of the U-shaped spring member having an



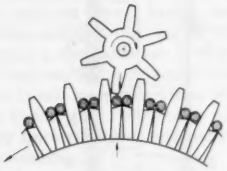
outwardly turned end adapted to engage the contact blade means opposite the end of the pin.

4,081,773

GROOVE RING FOR TOROIDAL-COIL DEFLECTION UNIT

Klaus Nitzsche, Straubing, Germany, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Apr. 14, 1976, Ser. No. 676,782
Claims priority, application Germany, Apr. 16, 1975, 2516760
Int. Cl.² H01F *41/08*
U.S. Cl. 335—213 **4 Claims**



1. A groove ring for the deflection unit of a television set, which deflection unit includes a toroidal wire coil surrounding a toroidal core, and which groove ring is provided with an inner circumferential surface comprising:

a plurality of first ridges located in spaced apart relationship on said inner circumferential surface, the width of said ridges decreasing towards said inner circumferential surface and the space between said ridges defining grooves;

a plurality of second ridges on said inner circumferential surface;

two of said second ridges being located in each of said grooves, said second ridges being of equal length, which length is less than said first ridges; and

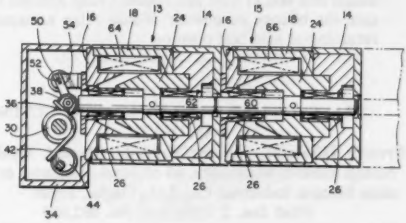
a third ridge formed between the two second ridges for separating wires in said groove.

4,081,774

ACTUATING DEVICE

William J. Barrett, and Hal G. Meyer, both of Rockford, Ill., assignors to Barber-Colman Company, Rockford, Ill.

Filed Apr. 12, 1976, Ser. No. 676,124
Int. Cl.² H01F *7/18*
U.S. Cl. 335—228 **12 Claims**



1. At least two electromagnetic force motors for actuating an external control device which is normally biased to a first position, each of said motors comprising:

a housing open at both ends thereof, said control device being positioned at one of said open ends of a first motor,

a center rod in said housing supported on bearings for linear movement toward and away from engagement with said control device,

electromagnetic circuit means operable for selectively positioning said rod at any desired point between actuated and unactuated positions, said rod being maintained at said unactuated position by the bias of said control device in the absence of operation of said circuit means,

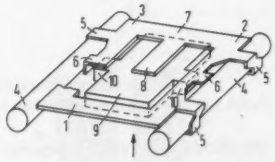
the other open end of said housing receiving additional force motors, the center rods of each motor positioned in axial alignment and physical contact, thereby to increase the force applied to said control device when said force motors are actuated simultaneously.

4,081,775

APPARATUS FOR DAMPING THE BOUNCING OR CHATTER OF RELAY ARMATURES IN THE RELEASING POSITION

Friedrich Rockl; Helmut Stocker, both of Munich, and Gundokar Braumann, Neuried, all of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Mar. 24, 1977, Ser. No. 780,987
Claims priority, application Germany, Mar. 31, 1976, 2613808
Int. Cl.² H01F *7/08*
U.S. Cl. 335—271 **5 Claims**



1. In an electromagnetic relay having an electromagnetic coil and a relay armature, said relay armature being capable of moving from a rest position to an energized position upon energization of said coil and returning to said rest position upon deenergization of said coil, the improvement comprising:

armature stopping means located at said rest position for eliminating the chatter or bounce of the relay armature at the rest position by stopping the returning movement of said relay armature from said energized position to said rest position, said armature stopping means comprising at

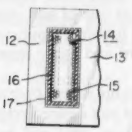
least one resilient strip capable of deflecting in response to the returning movement of said relay armature, whereby said deflection of said at least one resilient strip stores energy in said resilient strip for stopping said relay armature in said rest position, said armature stopping means further comprising means for generating independent counter forces opposing the deflection of said at least one resilient strip, whereby said counter force generating means and said at least one resilient strip interact to eliminate the bounce or chatter of said relay armature upon returning to said rest position.

4,081,776

TRANSFORMER WITH HEAT CONDUCTING LAMINATE

Hironori Hisamoto, Katano; Katsushi Muraki, Osaka, and Motoji Kimura, Matsusaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jun. 2, 1976, Ser. No. 692,039
Claims priority, application Japan, Jun. 16, 1975, 50-73459
Int. Cl.[2] H01F *27/22*
U.S. Cl. 336—61 **3 Claims**



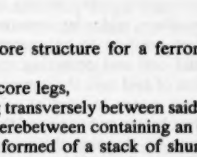
1. A transformer comprising a coil on a core and a lamination consisting of a sintered ceramic body which is made of alumina or mullite having a thermal conductivity higher than 10^{-3} cal/cm.sec.° C and an adhesive or resilient layer made of silicone rubber having a thermal conductivity higher than 10^{-3}, cal/cm.sec.° C interposed between said coil and said core.

4,081,777

FERROMAGNETIC CORE WITH VARIABLE SHUNT AIR GAP

Edward R. Cronk, Indianapolis, Ind., assignor to Thomas & Skinner, Inc., Indianapolis, Ind.

Continuation of Ser. No. 483,310, Jun. 26, 1974, abandoned.
This application Feb. 25, 1977, Ser. No. 771,883
Int. Cl.[2] H01F *27/24*
U.S. Cl. 336—165 **3 Claims**



1. A magnetic core structure for a ferromagnetic device, comprising

a pair of spaced core legs,

a shunt extending transversely between said legs for defining a shunt path therebetween containing an effective air gap,

said shunt being formed of a stack of shunt laminations of identical rectangular configuration, each having a length less than the distance between said legs by an amount equal to a predetermined maximum air gap length, and each having a preformed alignment hole therein offset longitudinally of the shunt lamination by a distance equal to one-half such maximum air gap length,

said laminations being stacked with said aligning holes in alignment so as to determine the positions of the laminations in the stack, and stacked in a selected stacking pattern in a plurality of groups of laminations with each group containing some laminations oriented with their long ends in one direction and at least one other lamination oriented with its long end in the opposite direction, the number of laminations oriented in one direction being not more than half the number oriented in the opposite direction,

the alignment of said offset holes causing the oppositely-oriented laminations to be offset in opposite directions in a pattern corresponding to said selected stacking pattern so as to provide an effective air gap in the magnetic shunt path intermediate that provided by offsetting all the laminations in one direction and that provided by offsetting generally equal numbers of laminations in opposite directions,

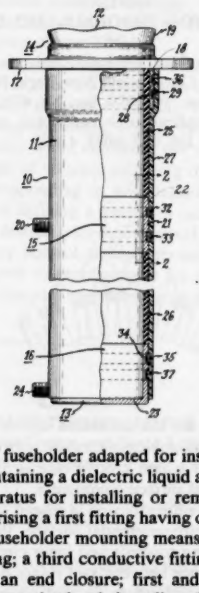
and a clamping element extending through said aligned alignment holes and clamping the laminations together to hold the same in such stacking pattern.

4,081,778

DRY WELL FUSEHOLDER

Stanley F. Sack, St. Andrews E., and Morris Mattuck, Lachute, both of Canada, assignors to Canadian General Electric Company, Ltd., Toronto, Canada

Filed Apr. 26, 1976, Ser. No. 680,209
Claims priority, application Canada, Sep. 8, 1975 234994
Int. Cl.[2] H01H *85/02*
U.S. Cl. 337—186 **7 Claims**



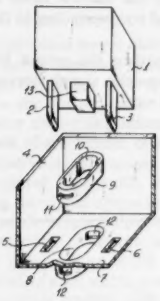
1. A leakproof fuseholder adapted for installation in electrical apparatus containing a dielectric liquid and accessible from outside the apparatus for installing or removing a fuse, said fuseholder comprising a first fitting having open ends, an annular portion and fuseholder mounting means; a second conductive annular fitting; a third conductive fitting having an annular portion and an end closure; first and second insulating tubes; said fittings and tubes being aligned axially with their annular portions in abutting relation in the following order: first fitting, first tube, second fitting, second tube, and third fitting so as to define a fuse receptacle; an outer shell of resin bonded fibers wound over the peripheral surfaces of the three fitting and two tubes and bonded to these surfaces; at least one seal for each fitting-tube joint located between the peripheral

surface of the fitting and outer shell spaced axially from the joint, said seals being composed of a material which swells on contact with said dielectric liquid; and an electrical terminal on the second and third fittings externally of the fuseholder, said second and third fittings having internal fuse contacting surfaces.

4,081,779
HOUSING INSERT FOR RECEPTABLE SEAT

Pierluigie Ranzanigo, Brescia, Italy, assignor to Bassani Ticino S.p.A., Milan, Italy

Filed Aug. 18, 1976, Ser. No. 715,326
Claims priority, application Italy, Sep. 18, 1975, 27375/75
Int. Cl.[2] H01R *33/06*
U.S. Cl. 337—198 **5 Claims**



1. An electrical device associatable with an electrical circuit, comprising a plurality of housings each provided with two conductive pins projecting substantially parallel from a respective housing, and a projection projecting from said housing and located between said conductive pins, the different housings corresponding to different nominal currents of the electrical circuit and having projections of different sizes; a receptacle having two holes each adapted for passing a respective one of said pins of each of said housings therethrough, said receptacle also having a central seat located between said holes; and a plurality of fittings each insertable into said seat of said receptacle and having a central recess, an outer contour of each of said fittings corresponding to the contour of said seat of said receptacle, the different fittings having recesses of different sizes each corresponding to the size of the projection of a respective housing so that, when one of said fittings is inserted into said seat of said receptacle only such a one of said housings can be mounted in said receptacle whose projection has a size corresponding to the size of the recess of the thus-inserted fitting, whereby a predetermined nominal current of the electrical circuit is assured.

4,081,780
EXPLOSION INHIBITING POTENTIOMETER ASSEMBLY AND DRIVE MECHANISM THEREFOR

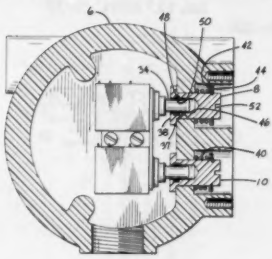
Terence Keith Rhind; Allen Howe Andrews, both of Riverside, Calif.; Warren Emil Burdine, Prescott, Ariz., and John Matthew Hendrie, Riverside, Calif., assignors to Bourns, Inc., Riverside, Calif.

Filed Nov. 26, 1976, Ser. No. 745,337
Int. Cl.[2] H01C *10/32*
U.S. Cl. 338—164 **3 Claims**

1. In an electromechanical adjustment assembly which includes a housing, a potentiometer disposed internally within said housing, said potentiometer including a rotatable drive means, and an orifice in a wall of said housing aligned with said drive means, the improvement comprising an operating means for said potentiometer which comprises:

an operating shaft extending through said orifice, said shaft including a flange on the interior of said housing and a spring retaining means on the exterior of said housing,

spring means retained between said retaining means and an exterior wall of said housing, said spring means urging said shaft outward to bring said flange into an area contact



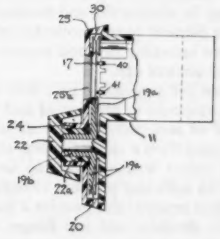
with the interior surface of said housing wall surrounding said orifice, thereby inhibiting outward propagation of an internal explosion within said housing, and

means carried by said shaft for engaging said potentiometer drive means and transmitting thereto rotations of said shaft.

4,081,781
STRIP POTENTIOMETER

Tor H. Petterson, 31248 Palos Verdes Dr. West, Palos Verdes Peninsula, Calif. 90274

Filed Aug. 19, 1976, Ser. No. 715,899
Int. Cl.[2] H01C *10/00*
U.S. Cl. 338—196 **13 Claims**



1. A potentiometer comprising:

an elongated tape fabricated of an electrically insulative material,

at least two elongated strips of an electrically conductive material on said tape, said strips running along the longitudinal extent of said tape opposite each other, at least one of the ends of said strips being joined together to form a loop,

at least two electrical wipers fixedly mounted relative to said tape, each of said wipers being in contact with an associated one of said strips, and

means for moving said tape parallel to the longitudinal axis thereof relative to said wipers,

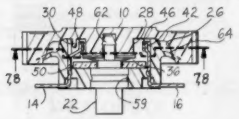
said tape having indicia marked therealong running coextensive with said strips for continuously indicating the resistance between the wipers for various positions of the tape relative to the wipers.

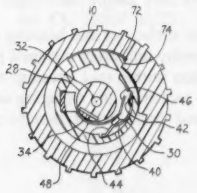
4,081,782

COMBINED ROTARY POTENTIOMETER AND SWITCH

Bradrick Alan Hildreth, Covina; Donald Harrison Stephens, Running Springs, and George Richard Wiley, Ontario, all of Calif., assignors to Bourns, Inc., Riverside, Calif.

Filed Aug. 4, 1976, Ser. No. 711,345
Int. Cl.[2] H01C 10/50
U.S. Cl. 338—200 18 Claims





1. A rotary potentiometer, comprising:
a body portion having an annular shoulder around its periphery,
a resistance element and collector means secured to said body portion,
termination means associated with said resistance element and collector means,
a control cap rotatably positioned over said body portion and forming therewith a housing for said resistance element and collector means, said cap having an annular flange abutting said body portion shoulder,
means securing said cap to said body portion, and
electrically conductive wiper means controlled by rotation of said cap for electrically and mechanically coupling said resistance element to said collector means,
switch means including first and second contact means situate in said control cap,
dowel means for separating said first and second contact means in response to rotation of said control cap,
at least one of said body portion shoulder and cap flange being formed from a stiffly flexible, resilient material, said securing means holding said cap and body portion together with sufficient pressure to deform said stiffly flexible, resilient material and provide a frictional seal between said body shoulder and cap flange, thereby sealing the interior of said housing and introducing a counter torque to rotation of said cap.

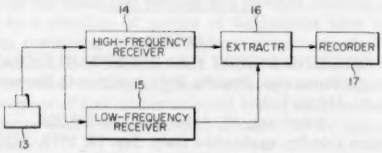
4,081,783

FISH FINDER CAPABLE OF DISCRIMINATING SIZES OF FISH

Keisuke Honda, 37, Shingashi-cho, Toyohashi, Aichi, Japan

Filed Sep. 22, 1976, Ser. No. 725,392
Claims priority, application Japan, Sep. 26, 1975, 50-115502; Sep. 26, 1975, 50-115503; Nov. 5, 1975, 50-132619; Nov. 5, 1975, 50-132620
Int. Cl.[2] G01S 9/70
U.S. Cl. 340—3 R 3 Claims

1. A fish finder capable of discriminating the sizes of fish, comprising:
a single transducer capable of transmitting and receiving high- and low-frequency ultrasonic sound waves simultaneously, one of said high- and low-frequency ultrasonic sound waves being emitted with a wide beam angle while the other of said waves is emitted with a narrow beam angle;
receivers for processing the high- and low-frequency echo signals received by said transducer,



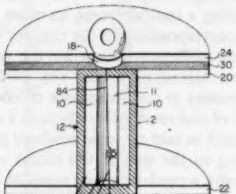
a subtractor circuit for subtracting the received echo signal corresponding to the narrow beam angle from the received echo signal corresponding to the wide beam angle, and
a recorder for recording the output from said subtractor circuit comprising echo signals corresponding to images of fish of desired size.

4,081,784

OMNIDIRECTIONAL MONITOR BUOY

Wayne D. Wilson, Silver Spring, and Arthur D. Delagrange, Sykesville, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 1, 1976, Ser. No. 728,814
Int. Cl.[2] G01S 9/66; H04R 1/34
U.S. Cl. 340—3 D 31 Claims



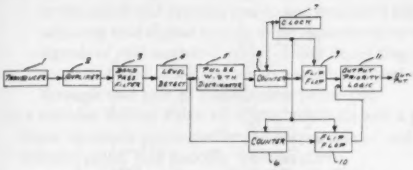
1. In an immersible acoustic doppler monitor system for detection of the patterned cadence propulsive movements of a distant object in the surrounding fluid, a transducer assembly comprising:
An active right circular cylindrical transducer element having a coaxial right circular cylindrical cavity extending between opposite bases;
an electrically conductive coating on the cylindrical surfaces of said element;
a resilient electrically insulative material encasing said element; and,
a first pair of elastic disks of a sound absorbent material, each coaxially disposed on opposite bases of said encased element, and each having a diameter in excess of said encased element.

4,081,785

DUAL CLASS AMPHIBIOUS TARGET DISCRIMINATOR

James C. Ravis, Minnetonka, and Curtis P. Hedman, St. Paul, both of Minn., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Feb. 13, 1974, Ser. No. 442,304
Int. Cl.[2] G08B 21/00; G01S 3/80
U.S. Cl. 340—5 R 2 Claims



1. A dual class amphibious target discriminator distinguishing between two target groups, one being waterborne objects and the other bottom traversing objects comprising a seismic transducer placed on the bottom of the water being crossed, said seismic transducer converting seismic signals into representative pulse signals characteristic of the objects, means to amplify the representative signals, means to filter the amplified signals at a predtermined bandwidth, the amplification and filtering emphasizing the signal characteristics of the objects, means to detect at a predetermined threshold the characteristic signals from said filter means to provide an output of a series of varying width logic pulses, pulse width discriminator means rejecting pulses exceeding a set width, a clock, a first sampling counter, said first sampling counter and said pulse width discriminator receiving simultaneously the series of varying width logic pulses, said first sampling counter counting the number of pulses occurring during a predetermined sample interval determined by said clock, a second sampling counter receiving pulses from said pulse width discriminator, the predetermined sampling period thereof being also controlled by said clock, and first and second flip-flops also being timed by said clock, said first and second flip-flops receiving the output pulses from said first and second sampling counters, respectively, with either counter reaching a preset count, an output flip-flop is set, this set flip-flop retaining the output for a set number of clock periods, the output of said second flip-flop counter being indicative of a waterborne object and the output of said first flip-flop being indicative of bottom traversing objects.

4,081,786

HYDROPHONE HAVING A DIRECTIVE LOBE IN THE FORM OF A CARDIOID

Monique-Jeanne-Marie Richard, Six Fours, France, assignor to Etat Francais represente par le Delegue Ministeriel pour l'Armement, France

Filed Aug. 16, 1976, Ser. No. 714,666
Int. Cl.[2] H04B 13/00
U.S. Cl. 340—10 9 Claims

1. A hydrophone having a cardioid-shaped directional lobe comprising:

a cylindrical casing including front and rear members, said rear member having an acoustic window therein and said front member being in the form of an annulus having a grooved inner surface and a central opening;

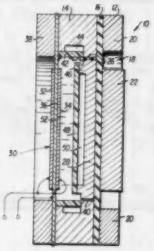
a bottom member;

means for securing the rear member of said casing to said bottom member, said bottom member being located within the central opening of the front member of said casing and spaced from the inner surface thereof to form a circular gap therebetween;

a wall element secured to said bottom member and spaced therefrom to form an enclosed first cavity;

a piezoelectric transducer having a flexible lamina secured to the front member of said casing and positioned within said central opening, said transducer being adjacent to and spaced from said wall element; and

a ring element secured within the groove of the inner surface of the front member of said casing to form a peripheral enclosure between said ring element and the inner surface of said front member, a first thin sheet of air being enclosed by said peripheral enclosure and a second thin sheet of air being enclosed by the cavity between said bottom member and said wall element, said thin sheets of air producing acoustic decoupling to permit reception of acoustic waves impinging on the rear member of said casing and minimizing the effect of acoustic waves received from other directions.

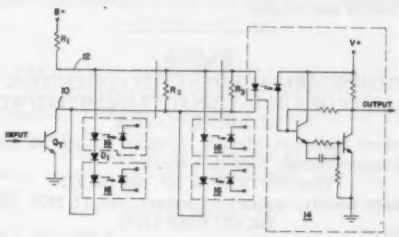


4,081,787

PRIORITIED PHOTO-ISOLATED DIGITAL DATA TRANSMISSION SYSTEM

Thomas W. Lee, Cupertino, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 27, 1976, Ser. No. 755,119
Int. Cl.[2] H03K 17/00
U.S. Cl. 340—147 R 6 Claims



1. A digital data transmission system comprising:

(a) means for transmitting digital data;

(b) means for distributing said digital data from said transmitting means;

(c) a plurality of receiver stages connected in parallel to said distributing means, each of said receiver stages having a receiver circuit which is photo-isolated from said distributing means and having a unique total voltage potential drop; and

(d) means for disconnecting each of said receiver stages from said distributing means;

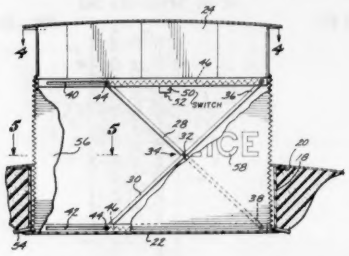
(e) whereby only said receiver stage having the smallest total voltage potential drop which is connected to said distributing means receives said digital data.

4,081,788

CONCEALED EMERGENCY SIGNALING DEVICE

Arturo S. Gaspar, 902 Watson, Wilmington, Calif. 90744

Filed Jan. 5, 1976, Ser. No. 646,525
Int. Cl.[2] G08B 5/00, 7/00
U.S. Cl. 340—137 **8 Claims**



1. A concealed emergency light assembly for mounting in the roof of a vehicle which comprises:

a generally flat, rectangular, open-top housing extending transversely of said vehicle and having a peripheral lip about its top edge for securing to the roof panel of said vehicle;

emergency signal enclosure means received within said housing and having transparent side walls and a top closure plate having a span to overlie said peripheral lip of said housing and a bowed contour following the roof contour of said vehicle;

emergency signal means including a plurality of spaced-apart signal devices extending transversely of said vehicle within said enclosure; and

enclosure lift means including an extendable assembly of a pair of arm members mounted one each at opposite sides of said assembly, longitudinally of said vehicle, and joined together in a pivotal connection at an intermediate point of their length and having at least one end of each of said pairs of said members in sliding connection to respective ones of the side walls of said enclosure and said housing and operative to elevate said enclosure from a received position totally within said housing to a raised position entirely without and elevated above said housing and the roof of said vehicle.

4,081,789

SWITCHING ARRANGEMENT FOR CORRECTING THE POLARITY OF A DATA SIGNAL TRANSMITTED WITH A RECURRENT CODE

Wernhard Markwitz, Munich, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Nov. 9, 1976, Ser. No. 740,223
Claims priority, application Germany, Nov. 12, 1975, 2550827
Int. Cl.[2] G06F 11/12
U.S. Cl. 340—146.1 AQ **6 Claims**

1. Apparatus for correcting the polarity of a transmitted data signal having a plurality of bits, comprising:

multistage register means for receiving said data signal,

syndrome circuit means for producing a syndrome signal in accordance with an error characteristic of said data signal,

clock generator means for producing at least a bit timing pulse and at least two block timing pulses,

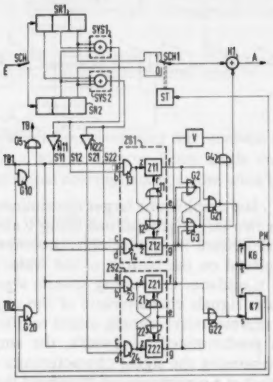
inverter circuit means for producing an inverted syndrome signal from said syndrome signal,

a number of scaling circuit means corresponding to the number of said block timing pulses, each scaling circuit having first and second binary counters and wherein a counting input on each of said counters is connected to a reset input on the other of said counters,

means for producing first indicating pulses upon coincidence between said block timing pulses and said inverted syndrome signal, said first indicating pulses being coupled to counting inputs of said second binary counters,

means for producing second indicating pulses upon coincidence between said block timing pulses and said syndrome signal, said second indicating pulses being coupled to counting inputs of said first counters,

output means for producing counting output signals from said first and second binary counters when predetermined counting levels have been reached,



switching means, responsive to said counting output signals, for producing a polarity signal indicating the correctness of the polarity of said data signal and

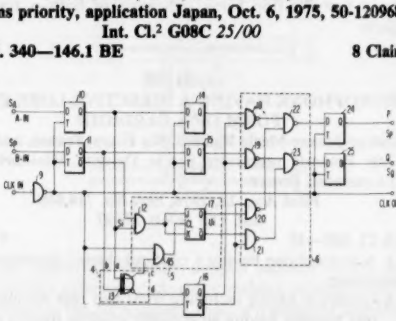
polarity adjusting means supplied with said polarity signal and operative to change the polarity of said data signal when the polarity signal indicates incorrectness of the polarity of the data signal.

4,081,790

CODE CONVERTER

Masami Yamamoto, Matsudo; Fumiaki Yamazaki, Tokyo; Akira Hosoda, Yokohama; Hiromi Hashimoto, and Yoichi Tan, both of Tokyo, all of Japan, assignors to Nippon Telegraph and Telephone Public Corporation and Nippon Electric Co., Ltd., both of Tokyo, Japan

Filed Oct. 6, 1976, Ser. No. 730,118
Claims priority, application Japan, Oct. 6, 1975, 50-120968
Int. Cl.[2] G08C 25/00
U.S. Cl. 340—146.1 BE **8 Claims**



1. In a digital transmission system in which two mutually-synchronized digital signals are transmitted through a pair of transmission paths, respectively, wherein the terminal-to-terminal correspondence between input and output side of said transmission paths has the possibility of being reversed, the improvement comprising a code converter circuit wherein said code converter circuit comprises:

a. an encoder having a pair of input terminals and a pair of output terminals connected to the input side of said transmission paths, said encoder including

i. a first detector connected to the pair of input terminals of said encoder for comparing and detecting the codes of the two signals in the same time slot among the digital signals to be transmitted,

ii. a modulo-2 adder circuit connected to the pair of input terminals of said encoder and responsive to an output of said first detector for developing a sum of said digital signals to be transmitted, and

iii. first switching means connected to the pair of input terminals of said encoder and to said modulo-2 adder for selecting said digital signals to be transmitted or output signals of said modulo-2 adder circuit depending on the output of said first detector to send out digital signals through said pair of transmission paths; and

b. a decoder having a pair of output terminals and a pair of input terminals connected to the output side of said transmission paths, said decoder including

i. a second detector connected to the pair of input terminals of said decoder for comparing and detecting the codes of the two signals in the same time slot among the digital signals transmitted through said pair of transmission paths,

ii. a modulo-2 subtractor circuit connected to the pair of input terminals of said decoder and responsive to the output of said second detector for developing a difference between said digital signals transmitted through said transmission paths, and

iii. second switching means connected to the pair of input terminals of said decoder and to output terminals of said modulo-2 subtractor for selecting said digital signals transmitted through said transmission paths or output signals of said modulo-2 subtractor circuit depending on the output of said second detector to reproduce the transmitted digital signals at the output terminals of said decoder.

4,081,791

METHODS AND APPARATUS FOR MAKING WRITING LEGIBLE BY A MACHINE FOR RECOGNIZING SHAPES

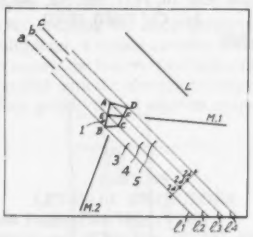
Jean Pollard, 27 rue du Parc a Foulon, 91120 Villebon S/Yvette, and Pierre Pollard, 15 rue E. Voisin, 94340 Joinville le Pont, both of France

Filed Mar. 23, 1976, Ser. No. 669,618

Claims priority, application France, Mar. 26, 1975, 75 09521

Int. Cl.² G06K 9/18

U.S. Cl. 340—146.3 A **18 Claims**



1. In a method of decoding information formed of detectable material characterizing segmentally stylized information displays each of which is patterned on a pair of adjacent quadrilateral configurations and aligned on the surface of a support one behind the other in a predetermined direction, the improvement comprising the steps of sequentially traversing each display with a detector responsive to the detectable material within each of three parallel sampling channels defined by and delimiting the display segments such that one of said channels bounds only those segments which would determine the upper right corner of a display presenting the information legibly.

4,081,792

MONOLITHICALLY INTEGRATED SEMICONDUCTOR CIRCUIT ARRANGEMENT

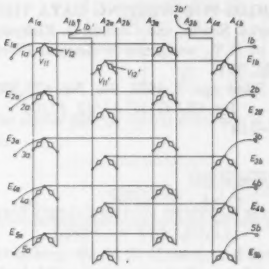
Hans Schüssler, Ulm (Danube); Hans-Jürgen Wulf, Heilbronn; Bernhard Rall, Ulm (Danube), and Helmut Knapp, Pfuhl, all of Germany, assignors to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

Filed Mar. 26, 1976, Ser. No. 670,825

Claims priority, application Germany, Mar. 29, 1975, 2514012

Int. Cl.² H04Q 3/00

U.S. Cl. 340—166 R **10 Claims**



1. In a monolithically integrated semiconductor circuit arrangement, particularly for switching matrices of tele-communications switching systems, including a plurality of semiconductor switching elements arranged in a matrix, a plurality of intersecting input and output circuit paths which are arranged in rows and columns and which may be selectively connected together by means of said switching elements, control or triggering means for switching on or blocking said switching elements to selectively connect said input circuit paths to said output circuit paths, and control or triggering lines leading from said control or triggering means to said switching elements, the improvement wherein: said switching elements are respectively connected in pairs and are arranged between every second input or output circuit path, said switching elements which have been connected together in pairs being connected together to the adjacent input line with one of their terminals and being connected individually to a respective one of the adjacent output lines with their other terminal.

4,081,793

DEVICE FOR READING OUT THE CHARGE CONDITION OF A PHOTOTRANSISTOR

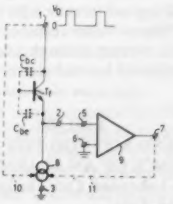
Jan Lohstroh, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 10, 1975, Ser. No. 639,359

Claims priority, application Netherlands, Dec. 16, 1974, 7416330

Int. Cl.² H04Q 3/00

U.S. Cl. 340—166 R **10 Claims**



1. A device for reading out the charge condition of a phototransistor by means of sampling pulses, the voltage at the emitter of said phototransistor being a measure of said charge condition, comprising means for applying sampling pulses to

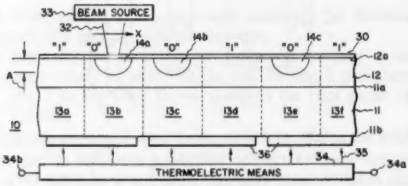
said phototransistor, a current source coupled to the emitter circuit of said transistor, said current source being switched on at the instant of sampling, a voltage comparator circuit, and means applying the emitter voltage of said phototransistor to said voltage comparator circuit for providing a voltage for switching off said current source at the instant that said emitter voltage drops below a prescribed reference value, thereby enabling the phototransistor to be fully discharged by each said sampling pulse.

4,081,794

ALLOY JUNCTION ARCHIVAL MEMORY PLANE AND METHODS FOR WRITING DATA THEREON

Harold G. Parks, Scotia, and Conilee G. Kirkpatrick, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 2, 1976, Ser. No. 673,080
Int. Cl.[2] G11C *11/42, 17/06*
U.S. Cl. 365—118 **21 Claims**



1. A memory plane for a non-volatile mass data storage memory capable of having its information content written in accordance with a preselected data pattern and responsive only to inducement of an elevated temperature therein at least partially by a heat-producing beam, said memory plane comprising:

a planar semiconductor diode structure comprising a substrate of a semiconductor material of a first polarity-type, said substrate having a first surface; and a layer of the same semiconductor material and of an opposite polarity-type, said layer being fabricated upon said first surface and having a top surface, opposite said first surface, with an array of a first plurality of possible data sites defined thereon; and

solid means fabricated only upon said top surface for eutectically forming an alloyed region of predetermined electrical characteristics in said layer of said planar diode structure at each of a second plurality of said data sites responsive to inducement of said elevated temperature thereat, said second plurality being less than said first plurality of said data sites, each said region permanently storing a bit of data thereat having a first binary value readable as a relatively small change in a current through the junction between said substrate and said layer, due to local recombination in said region, when said region is illuminated by an electron beam;

all remaining sites of said plurality of possible data sites being devoid of said regions to store a bit of data thereat having a remaining binary value readable as a relatively large change in said current through said junction when said region is illuminated by said electron beam.

4,081,795

APPARATUS AND METHOD FOR DETECTING THE OCCURRENCE OF AN ALARM CONDITION

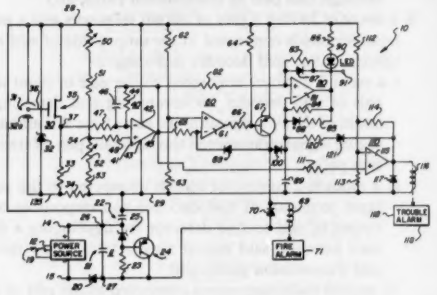
Francis T. Ogawa, Lakewood, Colo., assignor to Statitrol Corporation, Lakewood, Colo.

Filed Sep. 9, 1976, Ser. No. 721,838
Int. Cl.[2] G08B *17/10*
U.S. Cl. 340—237 S **15 Claims**

1. In apparatus for detecting the change of a selected condition from a normal to an alarm state in which the change in level of a difference signal which varies as a function of the degree of said condition is employed to generate an alarm signal to indicate that the degree of said condition has reached alarm state, the improvement in combination therewith of:

means for selectively setting the change in said difference signal level needed to generate said alarm signal whereby to control apparatus sensitivity;

means having an unlatched and latched state responsive to said difference signal for generating perceptible signals, said perceptible signal generating means being operable in its unlatched state to generate a variable output in the form of a series of perceptible pulses having a pulse rate proportional to the magnitude of said difference signal,



said perceptible signal generating means latching in its latched state in response to the level of said difference signal reaching the level corresponding to the degree of said condition reaching an alarm state and being operable in its latched state to generate a non-varying output; and,

means for selectively resetting said perceptible signal generating means to its unlatched state whereby with said perceptible signal generating means set in its unlatched state the pulse rate of said series of pulses functions to provide a perceptible indication of apparatus sensitivity when the degree of said condition is substantially in a normal state and a perceptible indication of the approach of alarm state as the degree of said condition changes from normal to alarm state.

4,081,796

FIRE ALARM DETERRENT

Prymas M. Tabron, 1625 Shadyside Rd., Baltimore, Md. 21218

Filed May 10, 1977, Ser. No. 795,646
Int. Cl.[2] G08B *15/02*
U.S. Cl. 340—304 **5 Claims**

1. In a guard against false alarms employing a housing for covering a fire alarm box and having dye associated with a portion thereof for marking the hand of a person sounding an alarm, the improvement comprising: the housing having structure, including a front wall, proportioned for forming an enclosure around a fire alarm box with the front wall spaced out a distance permitting manual access for fire alarm sounding, said structure defining an opening in the housing bottom; a door

having a free edge, the door resiliently affixed across said opening with the free edge at an upwardly inclined angle, the door proportioned for requiring an upward deflection of the free edge to produce manual access for fire alarm sounding, said resilient affixing of the door requiring sufficient force for said upward deflection for causing the free edge to produce a painful pressure on the hand of a person withdrawing a hand from the housing unless the hand is twisted during withdrawal, and the dye being applied adjacent the free edge of the door in position for spreading on a hand being twisted.

4,081,797

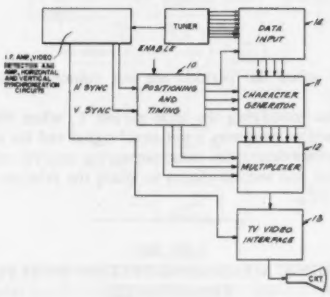
ON-SCREEN CHANNEL DISPLAY

John Emery Olson, Harbert, Mich., assignor to Heath Company, Benton Harbor, Mich.

Continuation of Ser. No. 303,338, Nov. 3, 1972, abandoned. This application Feb. 21, 1975, Ser. No. 551,918

Int. Cl.[2] G06K *15/20*

U.S. Cl. 340—324 AD **33 Claims**



11. A system for displaying a character on the raster of a television receiver comprising: means for developing coded data indicative of the character to be displayed, a seven segment decoder, means for coupling the coded data to the input of the seven segment decoder, means for using the output of the seven segment decoder to illuminate a seven segment display on the raster of a cathode ray tube, and wherein three outputs of the seven segment decoder represent the horizontal segments of the character to be displayed and the remaining four outputs represent the vertical segments thereof, and wherein there is provided a multiplexer, a horizontal scan counter, means for coupling the counter outputs to the multiplexer, means for coupling the three horizontal segment outputs to the multiplexer, a timing counter, means for using the timing counter to gate the four vertical segment outputs during each scan associated with the character display, and means for coupling the four gated vertical segment outputs to the multiplexer.

4,081,798

LET-BALL DETECTORS

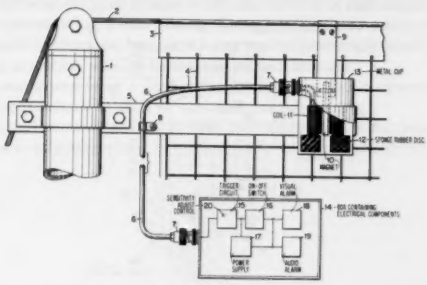
Lowell Sherman Pelfrey, Berkeley, Calif.

Continuation-in-part of Ser. No. 588,137, Feb. 23, 1976, abandoned. This application Mar. 14, 1977, Ser. No. 782,111

Int. Cl.[2] G08B *23/00;* **A63B** *61/00*

U.S. Cl. 340—323 R **4 Claims**

1. An apparatus for the detection and immediate warning that a let-ball has occurred in the act of serving a tennis ball; this apparatus comprises a suitable source of electrical energy, so connected as to provide energy to appropriate parts of the apparatus, a coil of electrically-conducting wire which is rigidly attached to a net post or the ground, a magnetic field intersecting said coil, said magnetic field being movable in response to the tennis ball hitting a net cable or net band, an electronic trigger circuit connected to the output of said coil and being responsive to the sensing of said magnetic field movement by said coil, and an output device connected to said trigger circuit in such a manner that when the trigger circuit is



turned on, the audio and/or visual evidence is perceivable by human senses.

4,081,799

CHARACTER GENERATION SYSTEM FOR A VISUAL DISPLAY TERMINAL

Mauritz L. Granberg; David G. Hanson, and Robert L. Rajala, all of St. Paul, Minn., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Mar. 3, 1976, Ser. No. 663,427

Int. Cl.[2] G06F *3/14*

U.S. Cl. 340—324 AD **11 Claims**

1. A system for intensifying and displaying dot-matrix characters of the type which includes a read-only memory for storing at addressable locations therein a plurality of characters, each said character being defined by a plurality of signals representative of Y rows and X columns of lighted discrete dot patterns to be displayed on a cathode ray tube, and memory addressing means for selecting one of said plurality of said characters, the improvement comprising:

a ready-only memory for receiving an address indicative of a character to be displayed and for generating a plurality of parallel signals representative of the Y row of dots of said dot-matrix character to be displayed,

timing means, including row counting means, connected to said read-only memory for producing a discrete Y count of the row of dots of said dot-matrix character to be displayed,

a Y row register connected to said read-only memory for receiving and storing said plurality of signals representative of said Y row of said discrete rows of dots being generated by said read-only memory,

said Y row register being connected to the intensity grid of said cathode ray tube for indicating the absence or presence of signals representative of lighted dots of said dot-matrix character,

scanning means for gating one of said signals from said Y row a column at a time to said cathode ray tube intensity grid,

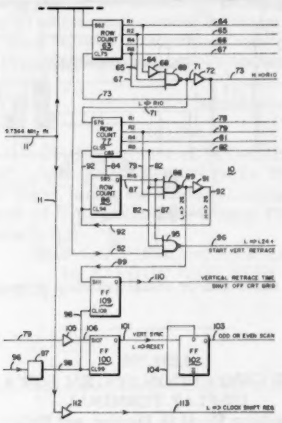
character row storage means for receiving and storing a plurality of signals representative of a Y + 1 row of said discrete rows of dots of said dot-matrix character to be displayed, said character row storage means being connected to said read-only memory,

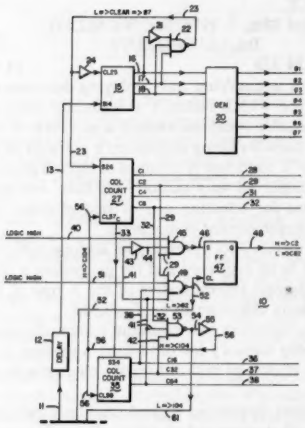
said row counting means comprising row counter advance means connected intermediate said read-only memory and said timing means for producing a Y + 1 count of the row of dots of said dot-matrix character to be displayed,

a Y + 1 row register connected to said character row storage means for receiving and storing said plurality of signals representative of the Y + 1 row of said discrete rows of dots being generated by said character row register, and

logic means connected intermediate said scanning means and said row registers for comparing the signals stored at the

same column of said Y row and said Y + 1 row and for generating an intensifying signal representative of a dot to





be inserted between said rows of adjacent dots in said dot matrix pattern.

4,081,800

ANALOG-TO-DIGITAL CONVERTER

Hiroshi Amemiya, Fujisawa; Tadaaki Tarui, Kawasaki, and Tsuneo Yoneyama, Yokosuka, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Oct. 23, 1975, Ser. No. 625,035

Claims priority, application Japan, Oct. 24, 1974, 49-121926; Oct. 24, 1974, 49-121929

Int. Cl.[2] H03K *13/20*

U.S. Cl. 340—347 NT **11 Claims**

3. In an analog-to-digital converter having an integrator which integrates an inlput analog voltage and a reference voltage which is successively applied, and means for producing a digital output signal corresponding to the input analog voltage during the conversion cycle;

the improvement which comprises:

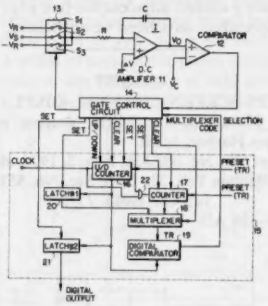
means for supplying a reference voltage having the same polarity as the analog voltage;

first means for applying the reference voltage to the integrator for a first time period T_1 prior to the conversion cycle;

second means for applying the reference voltage to the integrator subsequent to the first time period T_1 for a second time period T_2;

clock means for producing clock pulses and measuring the time periods T_1, T_2 by counting the clock pulses;

a digital comparator for comparing a period $(T_1 + T_2)$ with a predetermined period $2T_R$ and producing a not-equal



signal when the periods are not coincident with each other;

means for modifying the time period T_1 when the digital comparator produces a not-equal signal and for repeating operations during the same measuring interval relating to the first and second means to attain the relation of $T_1 + T_2 = 2T_R$.

4,081,801

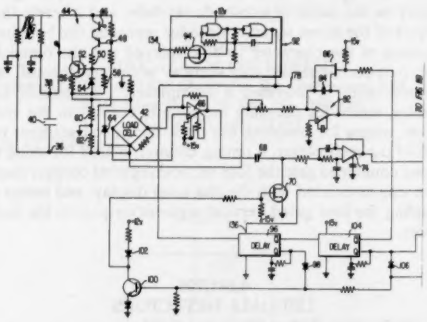
ELECTRONIC MEASURING SYSTEM WITH PULSED TRANSDUCER

Haydon C. Thomas, Lyndonville, and Harry J. Keen, Waterford, both of Vt., assignors to Colt Industries Operating Corp., New York, N.Y.

Filed Jan. 23, 1975, Ser. No. 543,465

Int. Cl.[2] H03K *13/02;* **G01G** *3/14*

U.S. Cl. 340—347 AD **37 Claims**

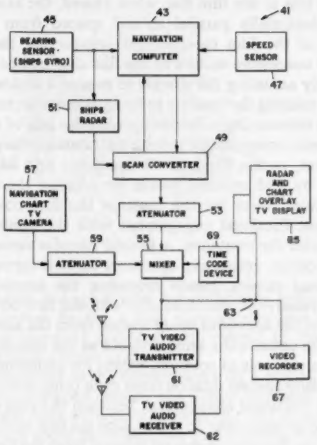


1. An electronic measuring system comprising measuring transducer means operative when electrically powered to provide an electrical measurement signal indicative of the magnitude of an entity being measured thereby, power means operative to power said transducer means, and stability sensing means connected to receive said electrical measurement signal and operating in response to an unstable electrical measurement signal to terminate the provision of power to said transducer means by said power means, said stability sensing means being responsive to the rate of change of said electrical measurement signal and operating when said electrical measurement signal changes in excess of a predetermined rate to prevent power from passing to said tranducer means from said power means.

4,081,802
RADAR AND NAVIGATION CHART OVERLAY VIDEO DISPLAY SYSTEM

Richard E. Elmore, Port Orchard, and Richard L. Plumb, Bremerton, both of Wash., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 6, 1977, Ser. No. 757,183
Int. Cl.² G01S 7/24
U.S. Cl. 343—5 ST **8 Claims**



1. A navigation system comprising:

(a) a radar for providing a radar output signal from a moving vehicle;

(b) first means for slewing said radar signal and providing a slewed radar signal defining a first region;

(c) second means responsive to the vehicle direction and vehicle speed for conditioning said slewed radar signal to provide a slewed and conditioned radar signal wherein the terrain remains fixed and the vehicle moves with respect to the fixed terrain;

(d) third means for converting said slewed and conditioned radar signal into a slewed and conditioned TV signal;

(e) fourth means for generating a chart TV signal defining a navigation chart of said first region, said fourth means including a scaling means for adjusting the image size of said navigation chart to correspond with the image size of said first region defined by said slewed and conditioned TV signal;

(f) fifth means for simultaneously combining and superimposing for displaying said slewed and conditioned TV signal defining said first region and said chart TV signal defining said first region; and

(g) sixth means for displaying the output of said fifth means.

4,081,803
MULTIOCTAVE TURNSTILE ANTENNA FOR DIRECTION FINDING AND POLARIZATION DETERMINATION

Richard C. Dempsey, Chatsworth, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

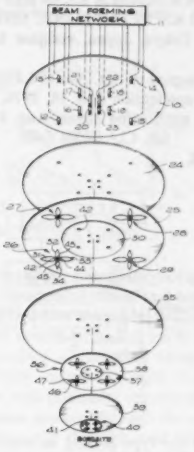
Filed Nov. 20, 1975, Ser. No. 633,623
Int. Cl.² H01Q 21/26, 21/28
U.S. Cl. 343—795 **12 Claims**

1. An antenna system having a high bandwidth and relatively small physical size and being adapted to employment with a variety of interconnecting networks for providing corresponding functions including direction finding and polarization determination, comprising:

a plurality of generally planar antenna subsystems generally arranged symmetrically about a center point in each of a successive plurality of substantially parallel terraces, each of said antenna subsystems in each of said successive terraces being of smaller scale, the boresite of said antenna system being a line passing through said center points of said terraces, said terraces being spaced from each other in a direction parallel to the line of said boresite;

means comprising a feed arrangement to provide external connections to each of said antenna subsystems;

ground plane means for each of said subsystems comprising a conductive plane extending over an area substantially



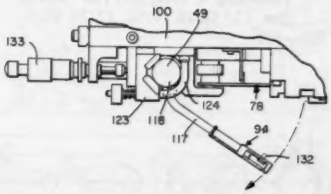
the same as covered by the corresponding one of said antenna subsystems, said ground plane being concentrically placed within and coplanar with the area of the antenna subsystem of the one of said terraces containing the next larger antenna subsystem except for the largest of said antenna subsystems, a separate spaced ground plane being provided for said largest antenna subsystem;

and radio frequency energy absorbing material emplaced at least in the gaps between said antenna subsystems and their corresponding ground planes.

4,081,804
CATCHER MOUNTING APPARATUS FOR A JET DROP PRINTER

Bertram Van Breemen, Dayton; Robert A. Miller, Lewisburg, and Roger D. Wells, Dayton, all of Ohio, assignors to The Mead Corporation, Dayton, Ohio

Filed Jul. 12, 1976, Ser. No. 704,574
Int. Cl.² G01D 15/18
U.S. Cl. 346—75 **19 Claims**



1. In a jet drop print head comprising means for generating a row of drop streams, an elongated catcher for catching selected drops produced by said streams, and a catcher mount for supporting said catcher adjacent said row of streams, the improvement wherein said catcher mount comprises support

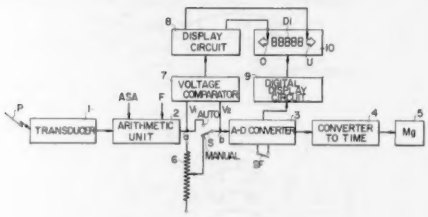
means connected to and supporting said catcher, mounting means for rotatably mounting said support means and enabling said catcher to be rotated from a catching position to a position separated from said jets, to enable charge plate inspection and adjustment means for translation adjustment of said mounting means to control the location of said catching position relative to said jets.

4,081,805

APPARATUS FOR DISPLAYING THE AMOUNT OF EXPOSURE IN A SINGLE LENS REFLEX CAMERA USING AN ELECTRONIC SHUTTER

Akira Takahashi, Tokyo, Japan, assignor to Ricoh Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 494,328, Aug. 2, 1974, abandoned. This application Jun. 15, 1976, Ser. No. 696,192
Claims priority, application Japan, Aug. 10, 1973, 48-89813
Int. Cl.[2] G03B *7/00*
U.S. Cl. 354—60 L **6 Claims**



1. A camera of the type having an electronic shutter, said camera comprising:

means for automatically setting an exposure time and producing a first output signal in accordance with the magnitude thereof;

means for manually setting an exposure time and producing a second output signal in accordance with the magnitude thereof;

means for respectively receiving one of said first and second output signals and operating said electronic shutter in accordance with the magnitude of the received signal;

means for respectively conducting one of said first and second output signals to said receiving means;

first means responsive to said receivng means for indicating an exposure time corresponding to the received signal in said receiving means;

means for comparing the magnitude of said first and second output signals and producing a comparative result; and

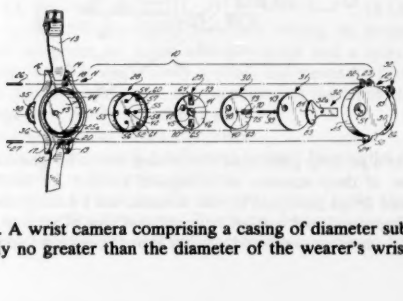
second means responsive to said comparing means for indicating the comparative result.

4,081,806

CAMERA

Bernard A Seckendorf, 144-23 77th Ave., Flushing, N.Y.

Filed Aug. 9, 1976, Ser. No. 712,484
Int. Cl.[2] G03B *19/02, 17/26, 9/10*
U.S. Cl. 354—121 **17 Claims**



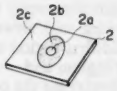
1. A wrist camera comprising a casing of diameter substantially no greater than the diameter of the wearer's wrist and having a cylindrical interior defined by a cylindrical side wall and circular end walls, a wrist band for snugly securing the casing to the wrist, a cylindrical chamber formed in the casing, a cylindrical photographic film cassette received in the chamber coaxially with the chamber, a disc of photographic film coaxially received in the cassette and having an aperture at the center thereof, means for rotating the cassette about its axis from outside the casing, a lens mounted in an end wall of the casing, a shutter for admitting the passage of light from the lens to the film disc when open and blocking the passage of light from the lens to the film disc when closed, the axis of the lens being substantially parallel to and spaced from the axis of rotation of the film cassette and intersecting the film disc, whereby successive sectors of the film disc can be exposed by alternately actuating the shutter to expose a sector of the film disc and rotating the cassette to bring another sector of the film disc into intersecting relationship with the axis of the lens, the film cassette comprising a cylindrical container having a circular bottom, means fixed to the container and adapted to be engaged by said rotating means for rotating the container, a first circular cover for the cassette, the first cover being in insufficient frictional engagement with the container that it rotates with the container, a second circular cover overlying the first cover, respective apertures formed through the first and second covers, means mounting the second cover for rotation relative to and coaxially with the first cover, the axis of each of the apertures being spaced from the axis of rotation of the film cassette the same distance as the spacing of the lens axis from said axis of rotation, means for maintaining the covers in axially spaced relation from each other whereby there is not such frictional engagement between the two covers as to cause the second cover to rotate with the first cover, means for holding the film disc in spaced relation from the first cover and from the bottom of the cassette, whereby the film is developable in the cassette with the apertures in the covers out of registry and without the benefit of darkroom facilities, the film disc in the cassette then being inaccessible to light but fully accessible to developing liquid.

4,081,807

REFLEX MIRROR FOR SINGLE LENS REFLEX CAMERA

Fumio Urano, Omiya, and Akihiro Arai, Tokyo, both of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 13, 1977, Ser. No. 759,149
Claims priority, application Japan, Jan. 14, 1976, 51-3041[U]
Int. Cl.[2] G03B *19/12*
U.S. Cl. 354—152 **3 Claims**



1. In a reflex mirror for a single lens reflex camera including a semi-transparent area and a fully reflective area whereby some of the light entering the camera is reflected into a viewfinder/rangefinder optical system and some of the light also passes through the semi-transparent area onto a photodetector incorporated in the camera metering system, the improvements characterized by the reflex mirror comprising:

a. a central, elliptical, fully reflective area whose center coincides with the optical axis of the camera, and

b. a semi-transparent, elliptical area surrounding the central area,

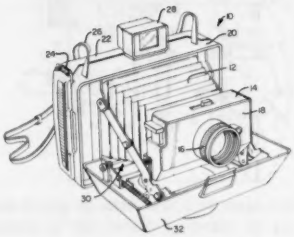
c. the remaining area of the mirror surrounding the semi-transparent area being fully reflective, whereby the projection of the mirror areas onto a focal plate of the camera forms a plurality of concentric circles, and a circular

distance measuring and focusing area in the center of said focal plate is brightly illuminated.

4,081,808
ERECTING LINKAGE AND COVER ASSEMBLY FOR PHOTOGRAPHIC CAMERAS

Donato F. Pizzuti, Saugus, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Sep. 2, 1976, Ser. No. 719,842
Int. Cl.² G03B *17/04*
U.S. Cl. 354—193 **13 Claims**



1. An erecting linkage system for collapsible bellows cameras, said cameras having a lens support movable between collapsed and operative positions with respect to the camera body, said linkage system comprising:

a cover connected to the camera body on a pivotal axis for movement between opened and closed positions;

a pair of cam links each connected at one end to said cover and pivotal about their said one end between folded and erect positions upon movement of said cover to said open position, said cam links each having a cam slot therein extending along the central portion of the length thereof;

a lens support locating frame pivotally connected to the other end of said cam links and latchable in an upright position when said cover is in its said open position, said locating frame comprising a U-shaped member having a base and a pair of upstanding legs, the upper end of said legs being pivotally connected at the other ends of said cam links, said legs define a recessed latch formation;

a folding linkage connected to the camera body and to said cover at points spaced from said pivotal axis, said folding linkage including a pair of folding link sets, one to each side of the lens support and each set having a lower link connected to said cover, a follower pin mounted on each of said lower links, each respective follower pin being engageable with one end of said cam slots in a past-dead-center position of said folding link sets and with said latch formation of one of said legs; and

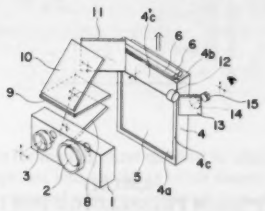
a lens support mounting member adjustably connected to said locating frame, said mounting member being also pivotally connected at said other end of said cam links and including a slotted flange connected to the base of said locating frame for pivotal adjustment about an axis intersecting said one end of said cam links.

4,081,809
VIEWFINDER SYSTEM FOR A LARGE CAMERA

Makoto Kuboshima, Sagamihara, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Jul. 23, 1976, Ser. No. 708,247
Claims priority, application Japan, Oct. 2, 1975, 50-119437
Int. Cl.² G03B *13/02*
U.S. Cl. 354—199 **3 Claims**

1. In a camera having a forward portion and a rear portion and employing a large format film, said camera comprising a taking lens assembly which includes a front lens assembly and a rear lens assembly supported in said forward portion of said camera for focussing the image of a scene to be photographed on film material in said rear portion of said camera, at least said front lens assembly being movable, externally actuable focussing control means for moving at least said front lens assembly forwardly and rearwardly with respect to said film material, the improvement comprising: a viewfinder system having an objective lens assembly which has a focal length equal to that of said front lens assembly and being generally level with and at a set distance to one side of said taking lens assembly within said camera forward portion, and being movable forwardly and rearwardly relative to said camera forward portion, connection and actuation means for causing said viewfinder objective lens assembly to be simultaneously moved forwardly and rearwardly a distance equal to that moved by said front lens assembly upon actuation of said focussing control means, an

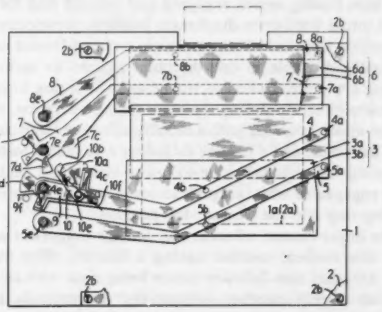


eyepiece located at an upper rear portion of said camera and on the opposite side of the optical axis of said taking lens assembly to that of said objective lens assembly, said viewfinder system including an optical system provided inside said camera, said optical system including an erecting relay lens means and means for transmitting image-wise light over a path leading from said objective lens assembly, rearwardly, upwardly and across a vertical plane passing through the optical axis of the taking lens assembly and through said erecting relay lens means to said eyepiece and to thus avoid the path of light directed by said taking lens assembly onto said film material, and wherein said viewfinder optical system path extends over a distance which is greater than the sum of the focal lengths of said objective lens assembly and said erecting relay lens means.

4,081,810
OPENING AND CLOSING DEVICE FOR CAMERA SHUTTER

Eiichi Onda, Yotsukaido, and Masanori Watanabe, Narashino, both of Chiba, Japan, assignors to Seiko Koki Kabushiki Kaisha, Japan

Filed Aug. 6, 1976, Ser. No. 712,400
Claims priority, application Japan, Aug. 6, 1975, 50-95519; Aug. 6, 1975, 50-108681
Int. Cl.² G03B *9/40*
U.S. Cl. 354—246 **6 Claims**



1. An opening and closing mechanism for the shutter blades of a camera having an aperture, at least one opening blade to initiate an exposure and at least one closing blade to terminate

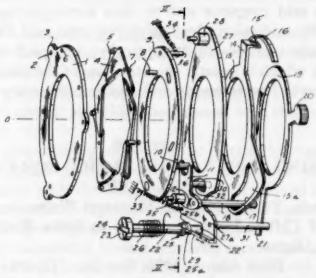
the exposure, comprising an opening member for operating the opening blade, a closing member for operating the closing blade, a driving member associated with the opening member, means for releasably connecting the driving member with the opening member, means for biasing the driving means in a direction to move said opening member connected thereto in a direction to move said opening blade from set position toward open position, means for biasing said closing member in a direction to move said closing blade from set position toward closed position, and means transmitting closing movement of said closing member said opening member to move said opening member in a direction to return said opening blades toward set position.

4,081,811

DIAPHRAGM PRESELECTOR FOR CAMERA OBJECTIVE

Albert Baab, and Paul Himmelsbach, both of Bad Kreuznach, Germany, assignors to Jos. Schneider & Co., Optische Werke Kreuznach, Bad Kreuznach, Germany

Continuation-in-part of Ser. No. 752,833, Dec. 21, 1976. This application Feb. 16, 1977, Ser. No. 769,204
Claims priority, application Germany, Dec. 22, 1975, 2557855
Int. Cl.² G03B *9/02*
U.S. Cl. 354—272 **9 Claims**



1. In a reflex camera having an iris diaphragm centered on an optical axis and provided with a setting ring rotatable about said axis, biasing means engaging said settable ring for urging same into a wide-open diaphragm position, preselector means adjustable to a desired stop position, a spring-loaded cam disk manually rotatable in one direction against its spring force during a windup stroke and rotatable by its spring force in the opposite direction during a picture-taking operation, cam-follower means coacting with a radially effective ramp surface of said cam disk, and a linkage including a yieldable lost-motion coupling between said cam-follower means and said setting ring engageable with said preselector means for entraining said setting ring into the desired stop position,

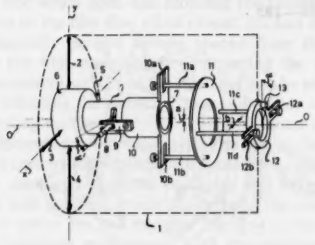
the improvement wherein said linkage comprises a swingable resilient member having a fulcrum offset from said axis, said cam-follower means being rigid with an extremity of said member substantially diametrically opposite said fulcrum with reference to said axis, said cam disk and said cam-follower means being provided with coacting surfaces for axially deflecting said extremity at the beginning of each windup stroke with consequent disalignment of said cam-follower means and said ramp surface for the remainder of said windup stroke.

4,081,812

PHOTOGRAPHIC LENS WITH PERSPECTIVE-ADJUSTMENT FEATURE

Werner Flöther, Oberkochen, Germany, assignor to Carl Zeiss-Stiftung, Oberkochen, Germany

Filed Mar. 10, 1977, Ser. No. 776,179
Claims priority, application Germany, Mar. 27, 1976, 2613159
Int. Cl.² G03B *5/06*; G02B *7/02*; G03B *7/08*
U.S. Cl. 354—286 **5 Claims**



1. An automatic-diaphragm lens system, comprising a lens and mount therefor on the lens axis, said mount including an automatic diaphragm including an angularly displaceable element tracking the diaphragm setting, adapter means for connecting said lens mount to a camera body on the mounting axis thereof, said adapter means including selectively operable means for adjusting the eccentric offset of said lens mount with respect to the camera-mounting axis thereof, and angle-transmitting means for transmitting the instantaneous angular position of said displaceable element to the camera-mounting end of said adapter means, said angle-transmitting means comprising a first ring member having a follower connection to said displaceable element and journalled for rotation on the lens-mount axis, a second ring member journalled for rotation on the camera-mounting axis and including an angularly displaceable element for control connection to a movable camerabody part, an intermediate floating-ring member interposed between said first and second ring members, first transverse-axis connection means coupling said first and intermediate ring members, and second transverse-axis connection means coupling said second and intermediate ring members, said respective transverse-axis connection means providing orthogonally related axes of component displacement eccentric to the camera-mounting axis.

4,081,813

PHOTOGRAPHIC INFORMATION SETTING APPARATUS FOR CAMERA

Masaharu Kawamura, Hino; Nobuaki Sakurada, Yokohama; Tadashi Ito, Yokohama; Hiroyashu Murakami, Yokohama; Fumio Ito, Yokohama, and Nobuhiko Shinoda, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 26, 1976, Ser. No. 690,154
Claims priority, application Japan, Jun. 4, 1975, 50-67331
Int. Cl.² G03B *7/08, 17/02*
U.S. Cl. 354—289 **9 Claims**

1. A system for manually setting a photographic information into a digital exposure control circuit of a camera, said circuit having a pulse counter, said pulse counter having an input terminal and output terminals, which system comprises:

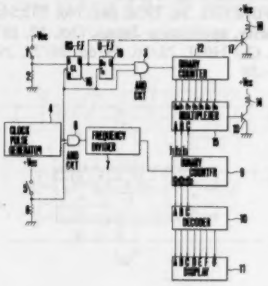
(a) indicating means coupled to the output terminals of said pulse counter for indicating an exposure information to be set corresponding to the content stored in the pulse counter;

(b) pulse forming means for producing a pulse train to be counted by the pulse counter;

(c) gate means connected between the pulse forming means and the input terminal of said pulse counter for controlling

a transmission of the pulse train from said pulse forming means; and

(d) set control switching means connected to said gate means, wherein said switching means energizes said gate



means during an interval of time measured from an initial actuation of the switching means by an operator to a subsequent actuation of the switching means by an operator when the value of the indicating means reaches a desired value.

4,081,814

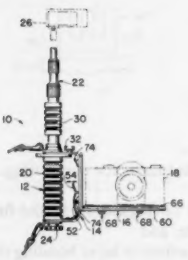
CAMERA FLASH BRACKET

Julian A. Bulland, 469 Pine St., San Francisco, Calif. 94104

Continuation-in-part of Ser. No. 561,083, Apr. 17, 1975, abandoned. This application Aug. 30, 1976, Ser. No. 718,736

Int. Cl.² G03B *17/00*

U.S. Cl. 354—293 **11 Claims**



1. A camera grip comprising a handle supportable by one hand, having first interlocking means, a bracket for carrying at least one camera, said bracket having first and second transverse faces, each of the faces having second interlocking means mateable to said first interlocking means, said first interlocking means being slidably engageable with either of said second interlocking means in a manner maintaining said bracket and said handle in invariably fixed relative orientation, and latching means for quickly joining and separating the bracket and the handle whereby the bracket can be quickly separated from the handle to permit rapid re-orientation of the camera.

4,081,815

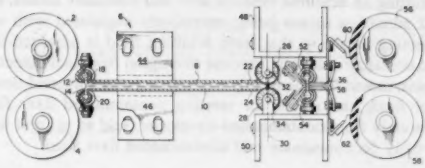
APPARATUS FOR GUIDING SHEET MATERIAL INTO COUNTERROTATING BRUSHES

Ellwood J. Horner, Armonk, N.Y., assignor to American Hoechst Corporation, Bridgewater, N.J.

Continuation-in-part of Ser. No. 215,533, Jan. 5, 1972, abandoned, and Ser. No. 349,737, Apr. 10, 1973, Pat. No. 3,809,105. This application Dec. 26, 1973, Ser. No. 427,672

Int. Cl.² G03D *3/08*

U.S. Cl. 354—319 **6 Claims**



1. In apparatus for treating sheet material in which said sheet material is transported into revolving brush means, including a pair of brushes mounted adjacent opposite sides of said sheet material, rotating in a direction opposite to the direction of travel of said sheet material and having a nip, the improvement comprising guide means, including a pair of generally-flat plates having a length substantially equal to the width of said sheet material, mounted adjacent opposite sides of said sheet material and immediately in front of said brushes, with respect to the direction of travel of said sheet material, and extending into the nip of said brushes to a point just in front of a vertical plane through the axes of rotation of said brushes and treating fluid dispensing means operatively connected to said plates to flood the space between said plates and, in conjuction with said plates, form a soaking chamber.

4,081,816

APPARATUS FOR PROCESSING PHOTOGRAPHIC FILM AND TREATING CONTAMINATED PROCESSING LIQUIDS

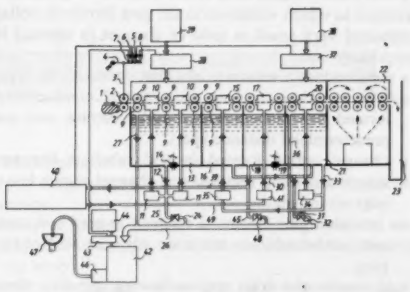
Erwin Geyken, and Peter Dawidowitsch, both of Munich, Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Germany

Filed Dec. 5, 1974, Ser. No. 530,049

Claims priority, application Germany, Dec. 7, 1973, 2361151

Int. Cl.² G03D *3/02*

U.S. Cl. 354—324 **4 Claims**



1. An arrangement for the development of latent images, comprising means for conveying an article which carries a latent image along a predetermined path including a first section for contacting said article with developer fluid, a second section downstream of said first section for washing said article, and a third section downstream of said second section for contacting said article with fixer fluid; means for detecting the

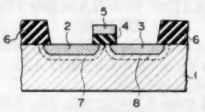
movement of said article along said path; means for contacting said article with developer fluid so as to develop the latent image on said article; means for washing said article so as to remove at least the predominant part of the developer fluid adhering thereto; means for contacting the washed article with fixer fluid so as to fix the developed image on said article; rinsing means downstream of said means for contacting said article with fixer fluid, said rinsing means including container means for accommodating a body of washing fluid into said container means, said admitting means being effective for admitting an acidified medium into said container means, and said admitting means being operatively associated with said detecting means so that fresh washing fluid is admitted into said container means in response to a signal from said detecting means; means for chemically neutralizing contaminated developer fluid; and means for treating contaminated fixer fluid separately from contaminated developer fluid so as to at least partially decontaminate said contaminated fixer fluid.

4,081,817

SEMICONDUCTOR DEVICE

Hisashi Hara, Kamakura, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Aug. 24, 1976, Ser. No. 717,459
Claims priority, application Japan, Aug. 25, 1975, 50-102065
Int. Cl.² H01L *29/80, 29/78*
U.S. Cl. 357—23 **4 Claims**



1. An insulated gate field effect transistor capable of miniaturization in which variations in the gate threshold voltage are maintained very small in spite of changes in channel length, comprising:

a semiconductor substrate of a first conductivity type,

source and drain regions of a second conductivity type formed in a first surface of said substrate, and spaced a predetermined distance apart,

a channel region formed in said substrate between said source and drain regions, said channel region less than 4 microns in length:

an insulated gate electrode coupled to said first surface of said semi-conductor substrate adjacent said channel region,

said source and drain regions having impurity concentrations much higher than that of said substrate so that depletion layers are formed in said substrate,

said depletion layers spreading into said substrate from said source and drain regions, and joining one another in said channel region,

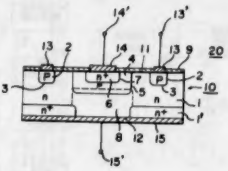
whereby variations in said gate threshold voltage are maintained small in spite of changes in length of said channel region.

4,081,818

SEMICONDUCTOR TEMPERATURE SENSITIVE SWITCHING DEVICE WITH SHORT CARRIER LIFETIME REGION

Josuke Nakata, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 14, 1976, Ser. No. 732,545
Claims priority, application Japan, Oct. 17, 1975, 50-124915
Int. Cl.² H01L *23/56, 29/66, 29/72, 29/74*
U.S. Cl. 357—28 **8 Claims**



1. A semiconductor heat sensitive switching device having high temperature dependency of the forward breakover voltage without decreasing the forward blocking voltage comprising:

a first semiconductor layer of a first conductive type;

a second semiconductor layer of a secnd conductive type opposite to the first conductive type for forming a first emitter PN junction disposed in the first semiconductor layer;

a third semiconductor layer of the second conductive type having a depletion layer region for forming a collector PN junction disposed in the first semiconductor layer; and

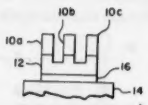
a high thermal carrier generation rate region formed in the depletion layer region of the third semiconductor layer.

4,081,819

MERCURY CADMIUM TELLURIDE DEVICE

Theodore T. S. Wong, Maynard, Mass., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jan. 17, 1977, Ser. No. 759,922
Int. Cl.² H01L *27/14*
U.S. Cl. 357—30 **4 Claims**



1. An infrared photodetector comprising:

a first substrate;

an epitaxial layer of (Hg,Cd)Te on the first substrate;

a second substrate; and

a silicone rubber adhesvie layer bonding the first substrate to the second substrate.

4,081,820

COMPLEMENTARY PHOTOVOLTAIC CELL

Sanjeev R. Chitre, Canoga Park, Calif., assignor to Sensor Technology, Inc., Chatsworth, Calif.

Filed Feb. 3, 1977, Ser. No. 765,251
Int. Cl.² H01L *27/14*
U.S. Cl. 357—30 **8 Claims**

1. A complementary photovoltaic cell comprising:

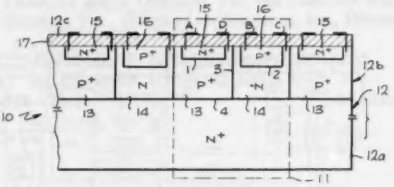
a semiconductor substrate,

alternate P+ and N type conductivity areas in said substrate,

each such area extending to the top surface of said substrate,

a region of N+ conductivity extending from said top surface into said P+ area to form an N+/P+ first photovoltaic junction, and

a region of P+ conductivity extending from said top surface into said N area to form a P+/N second photovoltaic junction,



said adjacent alternate areas forming a vertical P+/N third photovoltaic junction extending to said top surface,

said first and second junctions being opposite polarity photovoltaic sources, said third junction being usable in series with said first junction to increase the photovoltaic current output thereof.

4,081,821

BISTABLE SEMICONDUCTOR COMPONENT FOR HIGH FREQUENCIES HAVING FOUR ZONES OF ALTERNATING OPPOSED TYPES OF CONDUCTIVITY

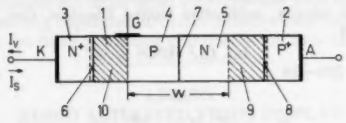
Jozef Cornu, Stekene, Belgium, and Roland Sittig, Brugg, Switzerland, assignors to BBC Brown Boveri & Company Limited, Baden, Switzerland

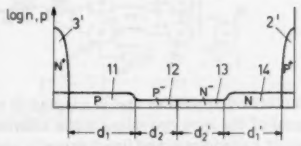
Filed Dec. 19, 1975, Ser. No. 642,551

Claims priority, application Switzerland, Dec. 23, 1974, 17240/74

Int. Cl.² H01L *1/04, 3/00, 5/00*

U.S. Cl. 357—38 **13 Claims**





1. A bistable semiconductor component for high frequencies with a semiconductor chip comprising a sequence of at least four zones of alternating opposed types of conductivity, the outer zones forming the emitter zones and being more heavily doped than the two inner zones, the base zones being so doped that with a voltage V_R smaller than or at most equal to the maximum inverse voltage V_{RS} applied in the reverse direction across the two emitter zones, the shortest distance W between the two blocking layers formed at the two outer junctions being less than the diffusion length L_B of the charge carriers in the base zones, at least one of the two base zones having at least two regions, each with constant doping concentration, with the concentration decreasing from region to region from each outer junction towards the inner junction.

4,081,822

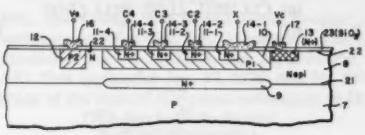
THRESHOLD INTEGRATED INJECTION LOGIC

Tich T. Dao, and Patrick A. Tucci, both of Cupertino, Calif., assignors to Signetics Corporation, Sunnyvale, Calif.

Filed Jun. 30, 1975, Ser. No. 591,400

Int. Cl.² H01L *27/04*

U.S. Cl. 357—44 **18 Claims**



1. An integrated injection logic circuit responsive to a plurality of input currents to provide a predetermined output as a logical combination of the input currents comprising:

a plurality of first transistors, each having a base, plural collectors, and an emitter, with at least one of said first transistors having one collector connected to the base, the transistors connected to receive said input currents and capable of conducting collector currents in response to said input currents, at least one additional transistor having an input electrode and including means for providing a threshold injection current to said additional transistor having a magnitude greater than said first transistor collector currents, the input electrode connected to the outputs of two or more of said first transistors for summing said first transistor collector currents to control the conduction state of said additional transistor as a function of the relationship between said summed first collector currents at said electrode and the weight of said injection current.

4,081,823

SEMICONDUCTOR DEVICE HAVING POROUS ANODIZED ALUMINUM ISOLATION BETWEEN ELEMENTS THEREOF

Charles R. Cook, Jr., North Palm Beach, Fla., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Division of Ser. No. 524,296, Nov. 15, 1974, Pat. No. 4,005,452. This application Jun. 23, 1976, Ser. No. 699,000

Int. Cl.² H01L *27/02, 27/12, 27/04*

U.S. Cl. 357—47 **7 Claims**

1. A semiconductor device comprising:

a body of semiconductive material of a first type of semiconductivity;

a plurality of spaced portions of an epitaxial layer of a second type of semiconductive material formed on a surface of the body;

a plurality of regions of first type of semiconductivity in pn-junction forming relation with said spaced portions;

a plurality of emitter forming regions of a second type of semiconductivity in pn-junction forming relation with portions of said regions of first type of semiconductivity; and

porous anodized aluminum, having a plurality of interstices formed therein, disposed between and in contact with said spaced portions of the epitaxial layer and extending to the

surface of the body to provide dielectric isolation between said spaced portions of the epitaxial layer.

4,081,824

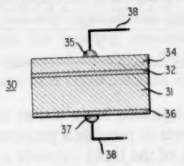
OHMIC CONTACT TO ALUMINUM-CONTAINING COMPOUND SEMICONDUCTORS

Vassilis George Keramidas, Warren, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 24, 1977, Ser. No. 780,977

Int. Cl.² H01L *23/48;* B01J *17/00*

U.S. Cl. 357—67 **8 Claims**



1. Method for making ohmic contact to a semiconductor body including a surface layer at least one micrometer thick consisting primarily of an aluminum-containing compound semiconductor,, comprising

a. depositing a transition layer of aluminum and at least one shallow dopant element on the body

b. depositing a layer of gold over and in contact with the transition layer and then

c. heating the body with said transition and gold layers thereon in a nonoxidizing atmosphere to a temperature above the temperature at which the transition layer is liquid and below the melting temperature of gold.

7. A method of claim 1 including the further step of applying an external contact to the gold layer.

8. A device made by the method of claim 7.

4,081,825

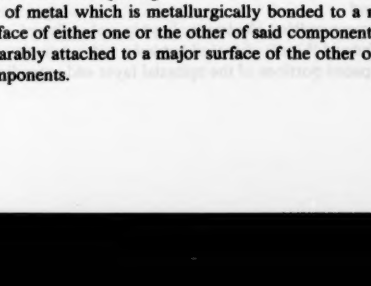
CONDUCTION-COOLED CIRCUIT PACKAGE

Nicholas George Koopman, Hopewell Junction, and Paul Anthony Totta, Poughkeepsie, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 720,471, Sep. 3, 1976. This application Mar. 18, 1977, Ser. No. 779,123

Int. Cl.² H01L *23/48, 29/40, 23/02*

U.S. Cl. 357—81 **16 Claims**



1. In a circuit package in which a heat-generating component is cooled by conduction of heat to a heat-sink component, the improvement comprising:

a pad of metal which is metallurgically bonded to a major surface of either one or the other of said components and separably attached to a major surface of the other of said components.

4,081,826

VIDEO TIME BASE CORRECTOR

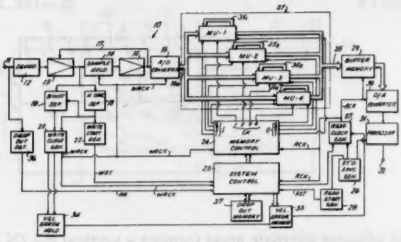
Takeshi Ninomiya, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed May 10, 1976, Ser. No. 684,488

Claims priority, application Japan, May 15, 1975, 50-58317

Int. Cl.² H04N *5/76, 5/78, 5/78*

U.S. Cl. 358—8 **6 Claims**



1. In a time base corrector which converts incoming information signals having periodic signal intervals to digital form and writes the digitized signals in a memory at a clocking rate which is modulated in accordance with time base errors in the incoming signals, whereupon the digitized signals temporarily stored in the memory are read out therefrom substantially at a standard clocking rate and the resulting digitized output from the memory is reconverted to analog form for eliminating the time base errors; said memory comprises a plurality of cyclically enabled memory units each of which stores a quantity of said digitized signals representing an even number of said periodic signal intervals of said information signals.

4,081,827

APPARATUS FOR ENCODING TELEVISION SIGNALS

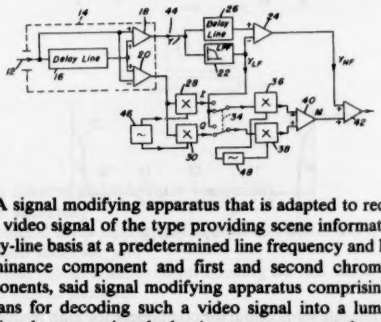
William E. H. Hipwell, Elstree, England, assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 27, 1976, Ser. No. 726,903

Claims priority, application United Kingdom, Oct. 1, 1975, 40168/75

Int. Cl.² H04N *9/34*

U.S. Cl. 358—14 **4 Claims**



1. A signal modifying apparatus that is adapted to receive a color video signal of the type providing scene information on line-by-line basis at a predetermined line frequency and having a luminance component and first and second chrominance components, said signal modifying apparatus comprising:

means for decoding such a video signal into a luminance signal representing the luminance component thereof and first and second ancillary signals representing respective chrominance components thereof;

means for supplying a third ancillary signal;

means for receiving said first, second and third ancillary signals and for suppressing, on an alternating basis line by line, one signal at a time from a set of at least two of said ancillary signals;

means for modulating the two unsuppressed ancillary signals for a line onto a subcarrier of preselected frequency to produce a subcarrier signal, such means including means

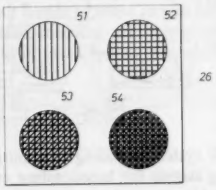
for establishing a phase displacement between such two unsuppressed ancillary signals; and

means for combining at least a portion of said luminance signal and said subcarrier signal into a composite signal.

4,081,828
METHOD FOR HALFTONE REPRODUCTION OF CONTINUOUS TONE IMAGES

Richard Claiborne Jones, Oakmont, Pa., and John RB Whittlesey, Houston, Tex., assignors to Geosource, Inc., Houston, Tex.

Filed Mar. 15, 1976, Ser. No. 667,180
Int. Cl.[2] H04N *1/46, 1/22*; G01D *9/42*
U.S. Cl. 358—75 **14 Claims**



1. A method for halftone reproduction of a continuous tone image from digital data representing the tonal densities of the image to be reproduced by a plurality of dot fields having different tonal densities, wherein each dot field contains a plurality of dots, comprising the steps of:

supplying said digital data to a plotter which is responsive to said data;

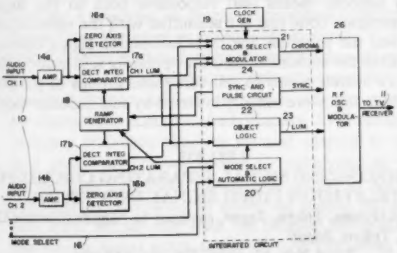
plotting dot fields with said plotter upon a photosensitive recording medium to produce a first exposure of said recording medium; and

plotting additional dot fields upon said first exposure of the recording medium to produce successive exposures of said recording medium, with at least some of the dots of the additional dot fields being superimposed upon the dots of preceding exposures, to create different tonal densities for the dot fields producing said continuous tone image.

4,081,829
AUDIO ACTIVATED VIDEO DISPLAY

Robert J. Brown, Palo Alto, Calif., assignor to Atari, Inc., Sunnyvale, Calif.

Filed Aug. 23, 1976, Ser. No. 716,765
Int. Cl.[2] H04N *9/02*
U.S. Cl. 358—82 **25 Claims**

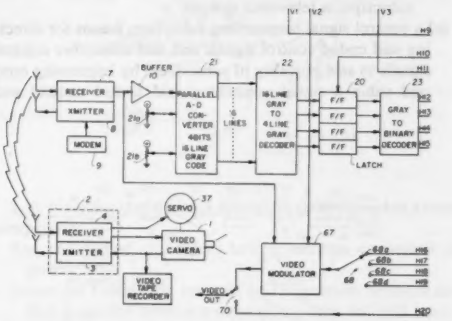


1. Apparatus for connecting an audio source to a color television receiver and producing an object on the screen of said receiver which varies both in shape and color in response to changes in the characteristics of an audio signal of said audio source comprising: means for generating first and second ramp signals each having a period related to the horizontal and vertical trace times of a frame of a television picture; means for comparing said ramp signals with a characteristic of said audio signal to generate a luminance signal; color modulator means responsive to a characteristic of said audio signal for generating a chroma signal; and means for driving the chroma and luminance circuits of said television receiver with said respective chroma and luminance signals.

4,081,830
UNIVERSAL MOTION AND INTRUSION DETECTION SYSTEM

Peter Mick, East Orange, and Donald Beck, Boonton, both of N.J., assignors to Video Tek, Inc., Mountain Lakes, N.J.

Continuation of Ser. No. 510,627, Sep. 30, 1974, Pat. No. 3,988,533. This application Jun. 17, 1976, Ser. No. 697,110
The portion of the term of this patent subsequent to Oct. 26, 1993, has been disclaimed.
Int. Cl.[2] H04N *7/18*
U.S. Cl. 358—105 **48 Claims**



1. A motion and intrusion detection system comprising:

means for scanning a given field and for generating scan signals corresponding to the content of said field;

means responsive to said signals for converting said scan signals into a plurality of coded digital signals which correspond to a predetermined characteristic of said field content at a plurality of points in said field;

storage means for selectively storing said coded information corresponding to said plurality of points;

means for comparing predetermined coded information corresponding to said plurality of points from a first scan of said field with the coded information corresponding to said plurality of points generated during a subsequent scan of said field on a point-by-point basis;

means for generating an alarm signal when a given difference is detected between said compared signals for corresponding points; and

means responsive to said alarm signals for generating an alarm indication.

4,081,831
HIGH SECURITY SUBSCRIPTION TELEVISION SYSTEM EMPLOYING REAL TIME CONTROL OF SUBSCRIBER'S PROGRAM RECEPTION

Danny Q. H. Tang, Northampton, and Bark L. Yee, Allentown, both of Pa., assignors to Twin County Trans-Video, Inc., Allentown, Pa.

Filed Apr. 8, 1976, Ser. No. 675,138
Int. Cl.[2] H04N *1/44*
U.S. Cl. 358—114 **9 Claims**

1. A subscription television system having means for collecting, processing and disseminating a plurality of television programs, at least some of which are in scrambled form, from a central transmitting station via cable distribution means to a plurality of individual subscribers, said system comprising;

(a) at least one video reproduction and modulation scrambling subsystem means for serving as a source of standard television program signals having sync and video components for amplitude modulating of a carrier signal, and for producing scrambled television signals characterized by the substantially complete polarity inversion of the amplitude modulation of the sync and video components of said standard television program signals, and for applying said standard television program signals or said scrambled television signals to a cable for distribution;

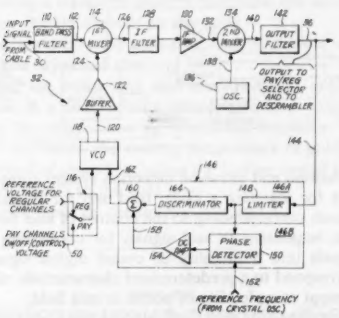
(b) central controlling subsystem means for:

(i) receiving program orders for individual subscribers, and for processing and storing said program orders;

(ii) generating coded control signals for controlling the scrambling sequence of said video reproduction and modulation scrambling subsystem means and for use throughout said subscription television system;

(iii) generating subscriber control signals having an address portion and a frequency determining portion for each subscriber being served to be used throughout said subscription television system;

(c) a control signal transmitting subsystem means for directing said coded control signals and said subscriber control signals to said plurality of subscribers by impressing onto said cable a signal containing said coded control and



subscriber control signals modulated onto a second carrier simultaneous with and separate from said sync and video carrying amplitude modulated carrier signal; and

(d) a plurality of subscriber control units each in receiving communication with said video subsystem means and said control signal transmitting subsystem means via said cable, and each adapted to provide standard television output signals, said subscriber control units comprising:

(i) converter means having a voltage controlled oscillator therein and connected to said cable for receiving and converting any one of a plurality of cable connected CATV channels to at least one predetermined frequency band in response to said frequency determining portion establishing a substantial part the frequency of said voltage controlled oscillator;

(ii) descrambler means connected to said receiving and converting means for descrambling said single predetermined frequency band in response to said coded control signals so as to render the resultant signal directly usable by a conventional TV receiver; and

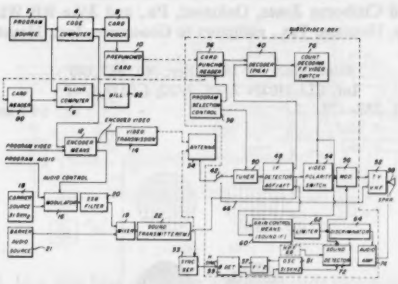
(iii) processor means connected to said cable for receiving and processing said coded control signals and said subscriber control signals and for applying said processed signals to, and partially controlling said descrambler means and converter means.

4,081,832

PAY TELEVISION SYSTEM, METHOD AND APPARATUS

Herbert Sherman, 25-16 150th St., Flushing, N.Y. 11354, assignor to Pay Television Corporation, New York, N.Y.

Filed Jun. 8, 1976, Ser. No. 693,834
Int. Cl.[2] H04N 1/44
U.S. Cl. 358—124 **15 Claims**



1. In a pay TV system including transmitter means arranged at a transmitting station for broadcasting encoded video and audio signals of at least one given program, and receiver means arranged at a receiving station for receiving and decoding said video and audio signals, the improvement which comprises:

(a) transmitter recording means arranged at the transmitting station (8) for prerecording on a subscriber card (10) program data (14) corresponding to a given program to be transmitted, said program data and additional decoding data being arranged in groups in a numbered column, whereby it may be visually identified by a subscriber as belonging to a specific program;

(b) said transmitter means including encoder means (12) for inverting first groups of selected picture lines of the program, the remaining second groups of picture lines being transmitted in their normal uninverted condition, said transmitter means also being operable to transmit, during intervals following the vertical sync pulses, a digital code signal including a group select signal for selecting from the card data of the column, a group of data required to decode respective signals, following encoded video signals;

(c) said receiver means including

(1) detector means (48) for detecting the encoded video signals;

(2) means including video polarity switch means (54) for transmitting the video signals to a television receiver;

(3) card reader means (36) for producing from the subscriber card, when transported to the receiving station, a program line code data signal; and

(4) decoder means (40) responsive both to the digital program code that is transmitted with the video signals and the program line code instruction signal obtained from the subscriber card for operating said video polarity switch means to reinvert those groups of program lines that were initially inverted by said encoder means.

4,081,833

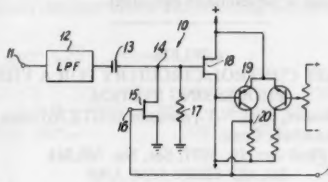
SYNCHRONIZING SIGNAL SEPARATING CIRCUIT FOR TELEVISION VIDEO SIGNAL PROCESSING

Hideo Akiyama, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Feb. 13, 1976, Ser. No. 658,021
Claims priority, application Japan, Feb. 17, 1975, 50-19624
Int. Cl.[2] H04N 5/08
U.S. Cl. 358—153 **5 Claims**

1. In combination in television wave synchronizing pulse separating apparatus, a source of reference potential, keyed clamping means for clamping synchronizing pulse peaks of the television wave to said reference potential responsive to an

applied keying pulse, clipping means responsive to said clamped television wave synchronizing pulser for producing an output synchronizing pulse train, direct current feedback



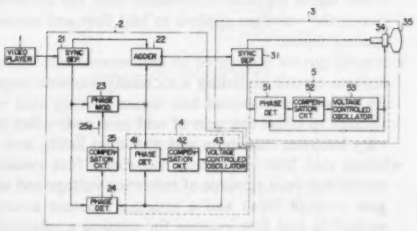
means for coupling said output synchronizing pulse train to said keyed clamping means to serve as said keying pulser, and D.C. coupling means coupling the output of said clamping means and the input of said clipping means.

4,081,834

SYSTEM FOR COMPENSATING JITTER OF VIDEO SIGNAL

Tadashi Takamiya, Nakaminato, and Yasufumi Yumde, Yokohama, both of Japan, assignors to Hitachi, Ltd., Japan

Filed Jun. 22, 1976, Ser. No. 698,519
Claims priority, application Japan, Jun. 24, 1975, 50-78865
Int. Cl.[2] H04N *5/04, 5/78, 5/76*
U.S. Cl. 358—158 **4 Claims**



1. A system for suppressing a phase fluctuation of a composite video signal accompanied therewith comprising:

means for extracting an original horizontal synchronizing signal from the input composite video signal;

means for phase modulating the original horizontal synchronizing signal extracted by said extracting means;

means including an AFC circuit unit having the same transfer characteristic as that of a horizontal AFC circuit of an ordinary television receiver set and adapted to control said phase modulating means by supplying an output signal from said phase modulating means to said AFC circuit unit, comparing in phase the output signal from said AFC circuit unit with the original horizontal synchronizing signal extracted from said extracting means and feeding back a resultant comparison signal to said phase modulating means; and

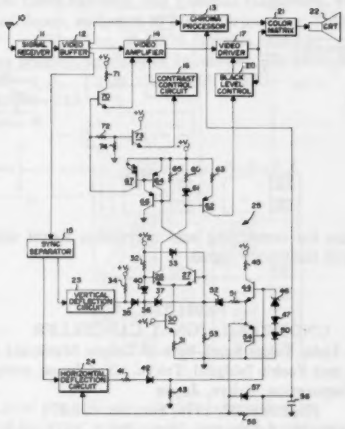
means substituting the original horizontal synchronizing signal contained in the composite video signal by the horizontal synchronizing signal subjected to the phase modulation at said phase modulating means to deliver out the phase modulated horizontal synchronizing signal.

4,081,835

BLANKING CIRCUITRY FOR A TELEVISION RECEIVER VIDEO SYSTEM

Arthur H. Klein, Attica, N.Y., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Filed Jan. 19, 1977, Ser. No. 760,364
Int. Cl.[2] H04N *3/24*
U.S. Cl. 358—165 **10 Claims**



1. A blanking circuit for a television receiver video system comprising:

first and second transistors having emitters connected together;

means for biasing the bases of said transistors to cause said first transistor to be in a conducting state and said second transistor to be in a non-conducting state;

means connected to the base of said first transistor for coupling negative-going pulses at a deflection rate to the base of said first transistor to cause said first transistor to switch to a non-conducting state and said second transistor to switch to a conducting state;

means connected to the base of said second transistor for coupling positive-going pulses at said deflection rate to the base of said second transistor to cause said second transistor to switch to a conducting state and said first transistor to switch to a non-conducting state; and

output means connected to the collector of at least one of said first and second transistors for deriving a blanking signal therefrom.

4,081,836

LUMINANCE SIGNAL PROCESSOR FOR PROVIDING SIGNAL ENHANCEMENT

Kenneth R. Skinner, Fort Wayne, Ind., assignor to The Magnavox Company, Fort Wayne, Ind.

Filed Nov. 30, 1976, Ser. No. 746,039
Int. Cl.[2] H04N *5/14*
U.S. Cl. 358—166 **10 Claims**

1. In a television receiver, a luminance signal processing apparatus comprising:

(a) a source of luminance signals:

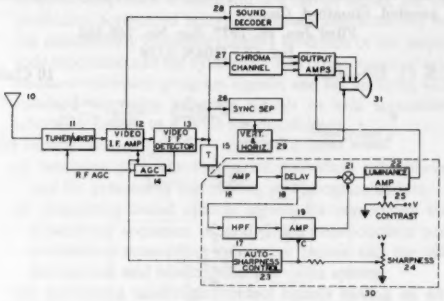
(b) means for producing a delayed luminance signal, said means being operatively connected to said source of luminance signals;

(c) means for deriving a correction signal, said means being operatively connected to said source of luminance signals;

(d) means for controlling the polarity and amplitude of said correction signal in response to a voltage level;

(e) voltage selection means, said means operatively connected to said means for controlling whereby the magni-

tude and polarity of said correcting signal may be changed by said voltage selection means; and



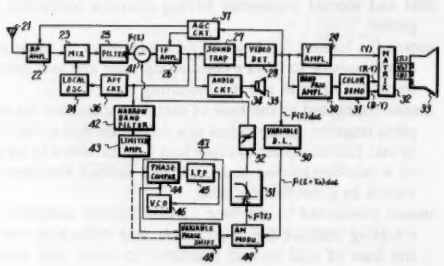
(f) means for combining said correction signal with said delayed luminance signal.

4,081,837

UNDESIRED SIGNAL CANCELLER

Masahiro Tada; Takao Sumi, both of Tokyo; Masayuki Hongu, Komae, and Yoshio Ishigaki, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jun. 22, 1976, Ser. No. 698,674
Claims priority, application Japan, Jul. 1, 1975, 50-81250
Int. Cl.[2] H04N *5/21*; H04B *1/10*
U.S. Cl. 358—167 **17 Claims**



1. Apparatus for cancelling an accompanying undesired signal from a desired signal comprising:

(a) signal input means for receiving an amplitude modulated signal which includes desired and undesired signals, the undesired signal being delayed by a time τ_o as compared with the desired signal;

(b) subtracting means connected to said signal input means;

(c) detector means connected to said subtracting means for demodulating an envelope signal component from the amplitude modulated signal output of said subtracting means;

(d) carrier wave generating means for generating an output carrier signal having a frequency corresponding to the frequency of the carrier of said amplitude modulated signal received by said signal input means;

(e) variable delay means connected to said detector means for delaying the envelope signal therefrom by the time $\tau_{o'}$;

(f) amplitude modulator means connected between said carrier wave generating means and said variable delay means for amplitude modulating the generated output carrier signal with the delayed envelope signal;

(g) variable phase shifting means for shifting the phase of the signal derived from said amplitude modulator means by an amount corresponding to the time $\tau_{o'}$;

(h) means for supplying the signal derived from said amplitude modulator means to said subtracting means for subtracting the signal derived from said amplitude modulated signal received by said signal input means; and

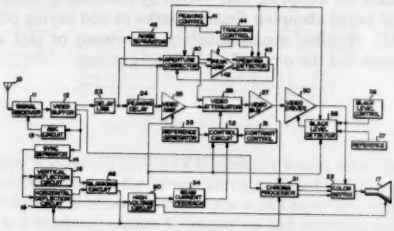
(i) signal output means connected to said detector means for providing a demodulated signal from which said undesired signal is substantially cancelled.

4,081,838

CONTRAST CONTROL CIRCUITRY FOR A VIDEO PROCESSING SYSTEM

Robert C. Wheeler, Elba, N.Y., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Filed Jan. 19, 1977, Ser. No. 760,361
Int. Cl.[2] H04N *5/14, 5/68*
U.S. Cl. 358—169 **5 Claims**



1. Contrast control circuitry for a video processing system comprising:

a gain controlled stage having a video signal input and first and second gain control inputs;

first bias means for providing a relatively constant voltage to said first gain control input;

second bias means for providing a variable voltage to said second gain control input, said gain controlled stage controlling the amplitude of video signals applied to said video signal input in accordance with the difference between the voltages applied to said first and second gain control inputs;

a control circuit connected to said second bias means, said control circuit including a manually variable impedance for causing said second bias means to vary said variable voltage to cause the gain of said gain controlled stage to vary between maximum and minimum limits; and

wherein said first bias means includes a first resistor connected between a source of reference voltage and said first gain control input and a constant current source connected to said first resistor for causing a relatively constant current to flow therethrough, and said second bias means includes a second resistor connected between said source of reference voltage and said second gain control input and a variable current source connected to said second resistor and to said control circuit for causing a variable current to flow through said second resistor in response to the setting of said manually variable impedance.

4,081,839

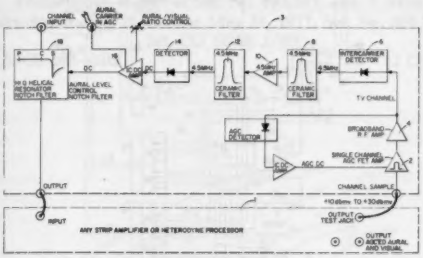
AURAL-VISUAL RATIO CONTROL APPARATUS

Martin Sperber, Cranford; Ragnars Martin Eggerts, Old Bridge, and George Scherer, East Brunswick, all of N.J., assignors to Blonder-Tongue Laboratories, Inc., Old Bridge, N.J.

Filed Oct. 18, 1976, Ser. No. 733,131
Int. Cl.[2] H04N *5/62*
U.S. Cl. 358—186 **3 Claims**

1. An aural-visual ratio control apparatus having, in combination, at least one of channel amplifier and heterodyne processor means having input and output terminals; means for connecting the output terminals to single channel RF amplifier means to apply thereto aural and visual carrier signals with the

latter being AGC stabilized; intercarrier detector means connected to the amplifier means for producing an output representing the difference between the visual and aural carrier frequencies, directly proportional to variation in the aural carrier; means for narrow-band filtering the output of the intercarrier detector means and detecting the same to produce



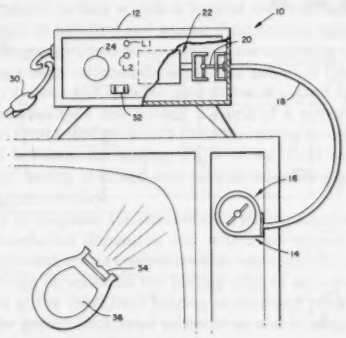
an aural level DC variable control signal; high-Q resonator notch filter means having an input and output and a DC notch depth control means responsive to said DC variable control signal; means for applying composite aural-visual signals to the said input of the notch filter and connecting the said output thereof with the said input terminals of said one of the channel amplifier and heterodyne processor means.

4,081,840

DUAL FUNCTION ACOUSTIC SWITCH

Eric A. Kolm, Brookline, Mass., assignor to Signal Science Systems, Inc., Framingham, Mass.

Filed Dec. 29, 1976, Ser. No. 755,212
Int. Cl.[2] H04N *5/44*
U.S. Cl. 358—194 **10 Claims**



1. An acoustic switch responsive to remotely generated acoustic signals in a predetermined frequency range for controlling at least two functions of an auxiliary device connected thereto, comprising:

A. a tuned transducer;

B. switch means switchable between first and second output states responsive to each acoustic signal received by said transducer;

C. means responsive to said switch means switching to its second state for generating an output pulse of a predetermined duration;

D. first control means responsive to the receipt of an acoustic signal by said transducer during the output pulse generated by said generating means for initiating control of a first function of the auxiliary device; and

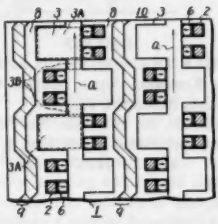
E. second control means responsive to said switch means being in its second state and to the termination of the output pulse generated by said generating means for initiating control of a second function of the auxiliary device, whereby the particular function controlled by said switch is determined by whether one or more acoustic signals are received by said transducer within said predetermined duration.

4,081,841

SOLID STATE IMAGE SENSOR

Shigeyuki Ochi, Machida, and Yoshiaki Hagiwara, Yokohama, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Sep. 15, 1976, Ser. No. 723,328
Claims priority, application Japan, Sep. 18, 1975, 50-113354
Int. Cl.[2] H04N *5/30*
U.S. Cl. 358—213 **10 Claims**



1. A solid state imaging device comprising:

(a) a plurality of sensing cells aligned in both horizontal and vertical directions;

(b) a plurality of vertical shift registers positioned between every two lines of said sensing cells aligned in the vertical direction transferring signal charge in one direction, each of said vertical shift registers comprising plural sets of transfer and storage portions, said transfer portions having higher surface potential relative to the surface potential of the successive storage portions to prevent the signal charge flow in the direction opposite to said one direction, said storage portions receiving a signal charge from the sensing cells or a preceding storage portion, a first pair of said storage portions extending to one vertical alignment side of said associated sensing cells, a second pair of said storage portions succeeding said first pair and extending to a second vertical alignment side of said associated sensing cells, and a front edge of certain ones of said transfer portions in respect to the direction of signal charge flow coinciding with a front edge of a narrow portion of said vertical shift register formed between said first and second pairs of said storage portions; and

(c) a horizontal shift register for receiving image carriers from said vertical shift registers and for deriving an output video signal.

4,081,842

FACSIMILE SYSTEM

Steven K. Harbaugh, Diamond Bar, and Richard E. Amtower, Laguna Niguel, both of Calif., assignors to Eocom Corporation, Irvine, Calif.

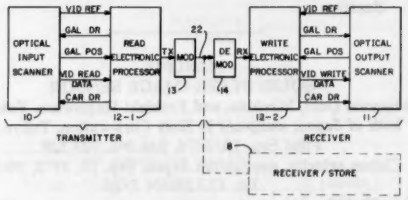
Filed Jun. 14, 1976, Ser. No. 695,921
Int. Cl.[2] H04N *1/12, 1/36*
U.S. Cl. 358—256 **23 Claims**

1. A data facsimile system comprising,

transmitter means including an input scanner for scanning input copy to form a read data signal representing the input copy, including means for generating a spatial read reference signal during scanning of said input copy, and including means for gating the read data signal with the read reference signal to form a transmission signal,

receiver means including an output scanner for scanning output copy under control of a write data signal, including

means for generating a spatial write reference signal during scanning of said output copy, and including means for



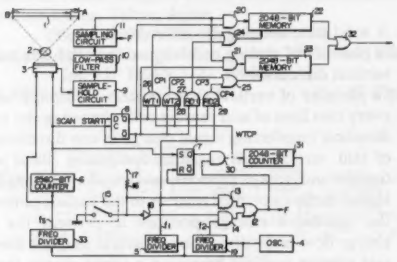
gating said transmission signal with said write reference signal to form said write data signal.

4,081,843

FACSIMILE TRANSMISSION APPARATUS

Michiaki Okano, Kawasaki, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Nov. 30, 1976, Ser. No. 746,200
Claims priority, application Japan, Dec. 1, 1975, 50-143624
Int. Cl.² H04N *1/02*
U.S. Cl. 358—294 **4 Claims**



1. A facsimile transmission apparatus comprising:

means for producing picture signals by scanning a region including the original sheet face of the original sheet of the maximum size in those sheets to be transmitted;

means for storing the picture signals produced by said means under the control of clock signals having different frequencies corresponding to the size of the original sheet and giving a predetermined number of bits for each horizontal scanning line to the width of the original sheet; and

means for reading out the picture signals stored in said storing means for transmission at the rate of synchronism with the scanning rate in the receiver side.

4,081,844

INTERLEAVED SYNCH AND BEGINNING OF DATA INDICATORS

Ernest William Devore, and Judson Allen McDowell, both of Boulder, Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 2, 1976, Ser. No. 710,832
Int. Cl.² G11B *5/09*
U.S. Cl. 360—48 **9 Claims**

1. A magnetic recorder for operating with a magnetic record member having a data record area preceded by a preamble area having synchronizing signals with interviewed beginning of record indicating signals;

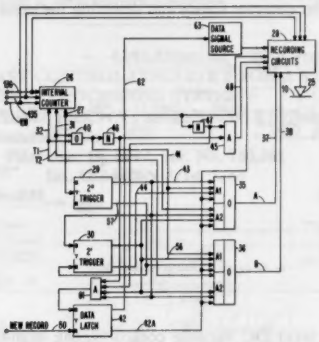
the improvement including in combination:

means for initiating operation of the recorder for sensing said preamble signals;

means in said recorder for detecting that a beginning of data indicator is being sensed;

control means responsive to a plurality of said beginning of data indicators to indicate beginning of data in accordance therewith;

beginning of data indicating recovery means responsive to said sensing means to indicate beginning of data when any



one of said plurality of beginning of data indicators is reliably sensed; and

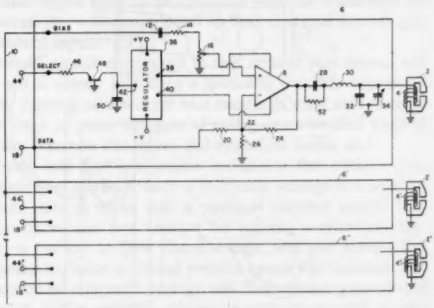
said sensing means includes common pattern in all of said beginning of data indicators to signify that a beginning of data indicator is being sensed.

4,081,845

MAGNETIC RECORDING WITH BIAS AND DATA MIXING CIRCUIT

Michael F. Braitberg, Larkspur, Colo., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jun. 29, 1976, Ser. No. 700,830
Int. Cl.² G11B *5/02*
U.S. Cl. 360—68 **7 Claims**



1. A magnetic recording head driving circuit comprising

a differential amplifier having a first and second input terminal and an output terminal,

means for applying a high frequency bias signal to said first input terminal of said amplifier,

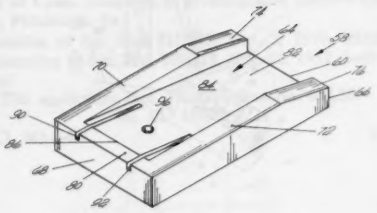
means for applying a data signal to said second input terminal of said amplifier whereby to superimpose said data signal on said bias signal at said output terminal of said amplifier, and

an impedance matching network connected between said output terminal and a recording head, said impedance matching network being configured to match the load impedance, including the recording head, on the amplifier to the output impedance of the amplifier at the frequency of the high frequency bias signal whereby to maximize the efficiency of the transfer of energy from the amplifier to the recording head at the bias signal frequency.

4,081,846
MAGNETIC HEAD-SLIDER ASSEMBLY

Thomas A. Roscamp; George W. Gibson, both of Goleta, and Pierre Anthony John Minton Shelley, Santa Barbara, all of Calif., assignors to Applied Magnetics Corporation, Goleta, Calif.

Continuation-in-part of Ser. No. 693,367, Jun. 7, 1976, abandoned. This application May 31, 1977, Ser. No. 801,759
Int. Cl.[2] G11B 5/60
U.S. Cl. 360—103 12 Claims



9. A multi channel magnetic transducer-slider assembly comprising

a ceramic member having a bottom slider face having leading and trailing edges and which is adapted to ride on a thin fluid film a predetermined distance above a moving media, said bottom slider face defining first and second substantially planar fluid bearing rails which extend in spaced parallel alignment along the edges of the member and which terminate in and are integral with a third flat fluid support surface which is located between and perpendicular to said first and second fluid bearing rails near the trailing edge , said bottom slider face including means defining a ramp surface extending from said third flat fluid support surface and between said first and second spaced fluid support rails and having a slope of a preselected angle to form a wedge shaped chamber having an opening located between the leading edges of the fluid support rails and having a closed end located adjacent said flat fluid support surface;

a plurality of magnetic transducers each having a gap width of a preselected dimension and which are spaced at a predetermined spacing therebetween, said magnetic transducer being mounted on the trailing edge of said ceramic member at the third fluid bearing surface and positioned with the gap of each head adjacent to and in alignment with said third fluid bearing surface;

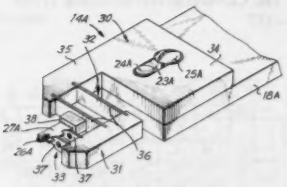
said plurality of magnetic transducers and said ceramic member co-acting with a moving media to enable said bottom slider surface and magnetic heads to be supported on a fluid film formed between said first, second and third bearing surfaces, said ramp surface and the surface of a moving media; and

said ramp surface is operative to receive fluid at the open end of said wedge shaped chamber and direct the same pass the flat fluid support surface producing a lifting force thereagainst to position said plurality of transducers a predetermined distance above the surface of said media equal to the thickness of said fluid film to position said heads across a moving media forming a plurality of tracks thereon wherein the width of each track is substantially equal to the preselected gap width of each magnetic transducer and the spacing between each track is substantially equal to the predetermined spacing between each magnetic transducer.

4,081,847
ROTARY HEAD ASSEMBLY

Osamu Shimada, and Katsumasa Takahashi, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Apr. 9, 1976, Ser. No. 675,462
Claims priority, application Japan, Apr. 14, 1975, 50-45036
Int. Cl.[2] G11B 5/52, 21/18
U.S. Cl. 360—107 11 Claims

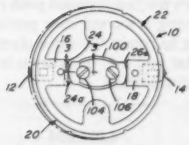


1. A rotary head assembly comprising a primary support member which is adapted to be moved in a circular path, an intermediate support member, first resilient means connecting said intermediate support member to said primary support member for yieldably resisting centrifugal movement of said intermediate support member relative to said primary support member and establishing a natural frequency therebetween, a head member for recording and/or reproducing an information signal, and second resilient means connecting said head member with said intermediate support member for providing said head member with a natural frequency of movement relative to said intermediate support member which is substantially greater than said natural frequency of said centrifugal movement of said intermediate support member relative to said primary support member.

4,081,848
HEAD CARRIER PROVIDING INDEPENDENT PROTRUSION ADJUSTMENT

Douglass Lane Blanding, Leroy, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 22, 1976, Ser. No. 679,258
Int. Cl.[2] G11B 5/58, 21/24
U.S. Cl. 360—109 7 Claims



1. For attaching a pair of magnetic heads to a rotatable drum section, a carrier element comprising:

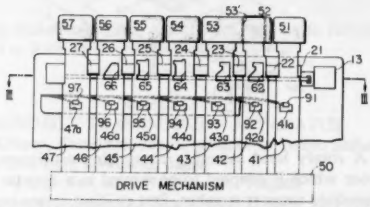
first and second substantially planar head mounting pads each of which has a surface adapted to receive a respective head of such a head pair;

at least one flexible C-shaped section rigidly connected at each end to a respective one of said pads, said pads being arranged in a spaced-apart relationship, for defining a space therebetween to permit adjustment movements along a reference line extending between centers thereof, without significantly shifting that line, by flexing said C-shaped sections and changing the degree of curvature thereof.

4,081,849
PUSH ROD TYPE TAPE RECORDER OPERATING DEVICE

Masanori Onishi; Tadashi Yoshikawa; Kiyoshi Ikoma, and Tetsuya Nakakohara, all of Kadoma, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Dec. 4, 1975, Ser. No. 637,666
Claims priority, application Japan, Dec. 10, 1974, 49-149907; Apr. 17, 1975, 50-47058
Int. Cl.[2] G11B *15/02*; G01M *1/168*
U.S. Cl. 360—137 4 Claims



1. A tape recording and reproducing apparatus comprising:

a slidable latch bar having first, second, third and fourth projections arranged along the length thereof, the first projection having a smaller extent than the extent of the other projections, the latch bar being rotatable about a pivot at one end thereof;

first means for obtaining a recording operation and including a recording push rod having a first cutout portion engageable with said first projection of said latch bar when the recording push rod is in an operative state;

second means for obtaining a playback operation and including a playback push rod having a second cutout portion engageable with said second projection of said latch bar when the playback push rod is in an operative state, and further operable to remain in the operative state when said recording push rod is in the operative state to effect said recording operation;

third means for obtaining a rewind operation and including a rewind push rod having a third cutout portion engageable with said third projection of said latch bar when the rewind push rod is in an operative state and having a first cam portion engageable with said latch bar to rotate the same about said pivot to such an amount that said first projection is disengageable from said first cutout portion of the recording push rod; and

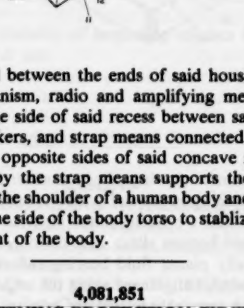
fourth means for obtaining a fast forward operation and including a fast forward push rod having a fourth cutout portion engageable with said fourth projection of said latch bar when the fast forward push rod is in an operative state and having a second cam portion engageable with said latch bar to rotate the same about said pivot to such an amount that said first projection is disengageable from said first cutout portion.

4,081,850
PORTABLE TAPE PLAYER AND TAPE CONTAINER

Richard D. Walden, 225 Pecan Dr., Martinez, Ga. 30907

Filed Jul. 27, 1976, Ser. No. 708,984
Int. Cl.[2] G11B *1/02, 1/04*
U.S. Cl. 360—137 1 Claim

1. A portable tape player for storing and playing magnetic tapes comprising an approximately rectangular housing which includes a bottom wall, end walls and side walls, speakers mounted in said housing at opposite end walls of said housing and facing so that sound is projected from each speaker away from the housing, a tape playback mechanism, radio receiver and amplifying means all mounted within said housing adjacent one end of said housing, said tape playback mechanism, radio and amplifying means including controls extending toward the top portion of said housing, a plurality of compartments, of size sufficient to carry prerecorded tape cartridges, formed inside said housing, the opening to each compartment located at the top of said housing, said compartments having side walls extending perpendicular to said bottom walls of said housing, said compartments occupying space in said housing not obstructed by said speakers, tape playback mechanism, radio and amplifying means, means for carrying said player at the side of the human torso comprising a concave recess defined in one side wall of said housing of a size and shape to receive the side portion of a human torso, said concave recess

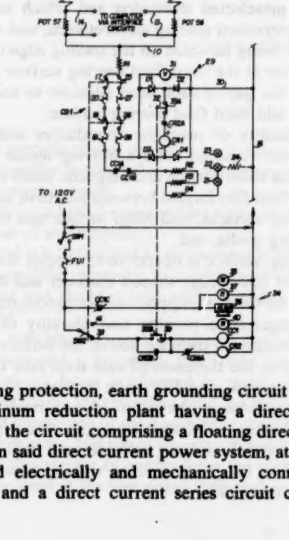


being positioned between the ends of said housing, said tape playback mechanism, radio and amplifying means all being positioned to one side of said recess between said recess and one of said speakers, and strap means connected at its ends to said housing on opposite sides of said concave recess of said housing, whereby the strap means supports the tape player suspended from the shoulder of a human body and the concave recess engages the side of the body torso to stablize the housing during movement of the body.

4,081,851
LIGHTENING PROTECTION CIRCUIT

Robert Van Ness Stevenson, and Courtland L. Robertson, both of Owensboro, Ky., assignors to Southwire Company, Carrollton, Ga. and National Steel Corporation, Pittsburgh, Pa.

Filed Feb. 24, 1976, Ser. No. 660,972
Int. Cl.[2] H02H *7/00*
U.S. Cl. 361—42 6 Claims



1. A lightning protection, earth grounding circuit in circuit with an aluminum reduction plant having a direct current power system, the circuit comprising a floating direct current neutral point in said direct current power system, at least one grounding rod electrically and mechanically connected to earth ground and a direct current series circuit connected

between said grounding rod and said floating direct current neutral point for effecting leaking to earth of static charges which may build up to high potential levels during electrical storm conditions and the like, said aluminum reduction plant having at least one pot line, composed of a plurality of series connected reduction cells, and wherein said floating neutral point is a point between two adjacent ones of said cells, a substantially equal number of said cells being connected between said point and respective poles of said power system.

4,081,852
GROUND FAULT CIRCUIT BREAKER

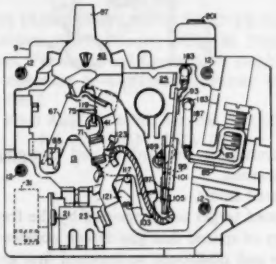
Kenneth R. Coley, Fairfield, and John J. Misencik, Shelton, both of Conn., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 511,895, Oct. 3, 1974, which is a continuation of Ser. No. 287,921, Sep. 11, 1972, both abandoned

This application Dec. 31, 1975, Ser. No. 645,587

Int. Cl.² H02H *3/28*

U.S. Cl. 361—45 **1 Claim**



1. A ground-fault circuit interrupter for use in a load center and comprising a circuit breaker, a ground-fault detector, and an insulation housing therefor and having a partition forming first and second side-by-side compartments, the partitions having aperture means and a slot therethrough; the circuit breaker being in the first compartment and comprising a pair of cooperable contacts operable between open and closed positions, an operating mechanism for operating the contacts and comprising a pivotally supported releasable member, latching means for latching the releasable member and including a trip member, the latching means including a bimetal member movable between latched and unlatched positions, the trip member being pivotally mounted on the side of bimetal member and adjacent to the releasable member, the trip member being movable to release said releasable member from the latched position, a load terminal structure in the first compartment, a line terminal structure, a line conductor of an A.C. electrical distribution system connecting the trip member to the load terminal structure, the bimetal member being adjacent to the aperture means and the slot; the ground-fault detector being in the second compartment and comprising a current monitoring core, a plurality of primary windings on the core, each being one of the line and a neutral conductor of the A.C. electrical distribution system, a secondary winding sensing current imbalance between the primary windings, means responsive to a predetermined sensing signal to open said line conductor, the monitoring core being on the side of the partition opposite the bimetal member and adjacent to the aperture means; the line conductor extending from the bimetal member in the first compartment and through the aperture means and through the monitoring core in the second compartment and back through the aperture means to the load terminal structure in the first compartment, the circuit extending from the bimetal member through the line conductor from the first compartment and through the core in the second compartment and back into the first compartment and to the load terminal structure, the means responsive to a predetermined sensing signal including a lever having a pivot unaligned with the slot and having a projection extending through the slot, and the projection being movable arcuately within the slot and against the trip member to unlatch the releasable member.

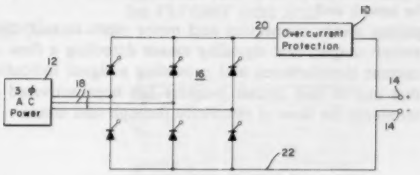
4,081,853
OVERCURRENT PROTECTION SYSTEM

Arthur K. Wickson, Palos Verdes Estates, Calif., assignor to The Garrett Corporation, Los Angeles, Calif.

Filed Mar. 23, 1976, Ser. No. 669,790

Int. Cl.² H02H *3/08*

U.S. Cl. 361—104 **11 Claims**



1. An overcurrent protection system in a d.c. circuit containing fuses for opening a circuit in response to an overcurrent condition, said system comprising:

first fuse means serially connected in a circuit and rated at a value less than full load current;

a second fuse means connected in parallel with said first fuse means and rated at a value less than full load current; and

impedance means connected serially with said second fuse means and in parallel with said first fuse means for permitting flow through each of said first and second fuse means during steady state conditions of a substantially aliquot portion of circuit current, impeding current flow through said second fuse means during an overcurrent until vaporization of said first fuse means, and permitting thereafter substantially full overcurrent flow through said second fuse means.

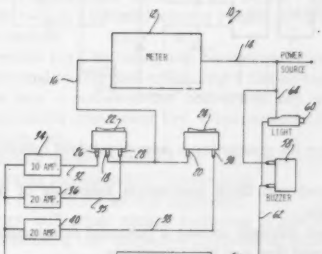
4,081,854
METER PROTECTION CIRCUIT

Jerry M. Frogge, 16475 Roberts, Roseville, Mich. 48066

Filed Nov. 1, 1976, Ser. No. 737,406

Int. Cl.² H02H *3/08*

U.S. Cl. 361—104 **3 Claims**



1. A circuit for protecting an electrical meter comprising:

a source of electrical energy;

an electrical meter having an input and an output, said input being connected to said source of electrical energy;

a first circuit breaker having a first amperage capacity;

a second circuit breaker having an amperage capacity higher than said first circuit breaker;

a third circuit breaker having an amperage capacity equal to the amperage capacity of said second circuit breaker;

a first on-off switch connecting said meter output to said third circuit breaker;

a second switch having its input connected to said meter output such that said second switch is electrically connected in parallel with said first switch, said second switch alternately connecting said electrical meter to said first and second circuit breakers;

a third on-off switch electrically connected to the output of said circuit breakers, the output of said third on-off switch being connectable to an electric circuit which is desired to be tested; and

signaling means connecting said meter input to said third switch output, said signaling means detecting a flow of current therebetween and providing a signal indicative that one of said circuit breakers has been activated to terminate the flow of electricity through said meter.

4,081,855

CURRENT PULSE GENERATOR

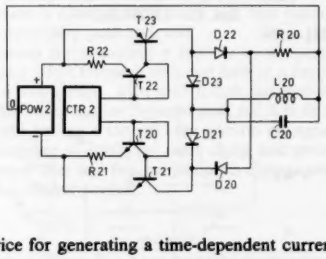
Adrianus Wilhelmus Maria van den Enden; Edmond de Niet, and Marinus Adriaan Deurwaarder, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 543,112, Jan. 22, 1975, abandoned. This application Jun. 25, 1976, Ser. No. 699,668

Claims priority, application Netherlands, Feb. 1, 1974, 7401400

Int. Cl.[2] H01H *47/32*

U.S. Cl. 361—203 **4 Claims**



1. A device for generating a time-dependent current, comprising:

first, second and third connection terminals of different potentials;

said second terminal having a potential intermediate than that of said first and third terminals;

an oscillator circuit, having first and second connection points;

two control elements each forming a controllable current source connected to said first and third terminals respectively, each of said control elements connected in series with a rectifying element, each of said rectifying elements being connected to a first connection point of said oscillator circuit, said second connection point of said oscillator circuit being connected to said second current connection terminal.

4,081,856

APPARATUS FOR FORWARDING AND CHARGING A BUNDLE OF FILAMENTS

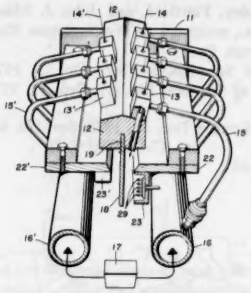
Ernest M. Sternberg, Chapel Hill, N.C., assignor to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 573,275, Apr. 29, 1975, Pat. No. 4,009,508. This application Aug. 9, 1976, Ser. No. 712,636

The portion of the term of this patent subsequent to Jun. 29, 1993, has been disclaimed.

Int. Cl.[2] H01T *19/04*

U.S. Cl. 361—225 **3 Claims**



1. An apparatus for forwarding and charging groups of filaments comprising

a. an elongated frame,

b. an elongated target bar supported by the frame,

c. a plurality of spaced first gas driven nozzles mounted on the frame and positioned to forward first groups of filaments into impingement with one side of the target bar at spaced first locations thereon,

d. a plurality of spaced first corona discharge electrodes mounted on the frame and positioned to apply electric fields to said first locations to charge said first groups of filaments,

e. a plurality of spaced second gas driven nozzles mounted on the frame and positioned to forward second groups of filaments into impingement with the other side of the target bar at spaced second locations thereon,

f. a plurality of spaced second corona discharge electrodes mounted on the frame and positioned to apply electric fields to said second locations to charge said second groups of filaments,

g. said first nozzles and first electrodes being positioned in a staggered relationship relative to said second nozzles and second electrodes.

4,081,857

LOW TEMPERATURE SINTERING CERAMIC CAPACITOR AND METHOD OF MAKING

R. C. Frederick Hanold, III, Greenville, S.C., assignor to Union Carbide Corporation, New York, N.Y.

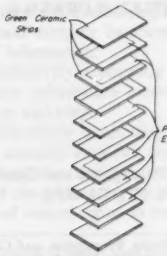
Continuation of Ser. No. 536,660, Dec. 26, 1974, abandoned. This application Sep. 13, 1976, Ser. No. 722,627

Int. Cl.[2] H01G *4/12*

U.S. Cl. 361—321 **9 Claims**

1. A ceramic capacitor comprising in combination a lead-free dielectric ceramic body in the form of a mixture fired and matured at a maturing temperature not higher than about 1120° C. said mixture before firing consisting essentially of a mixture of the following ceramic materials (i) from 60 to 95% by weight of uncalcined lead free base ceramic material sized not larger than about 2500 A and (ii) about 5 to 40% by weight of lead-free cadmium oxide-containing ceramic material, and electrode material formed on said body in capacitive relationship said base ceramic material not being subjected to a tem-

perature as high as said maturing temperature for any substantial period of time prior to firing and said maturing temperature



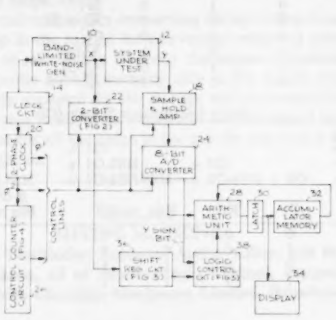
of said mixture being substantially higher than any temperature to which said mixture has been previously subjected.

4,081,858

SYSTEM FOR COMPUTING WIENER KERNELS

Arthur J. Koblasz, Sierra Madre; Derek H. Fender, Altadena; Syozo Yasui, Pasadena, and Cornelis M. Dekker, Duarte, all of Calif., assignors to California Institute of Technology, Pasadena, Calif.

Filed Aug. 19, 1976, Ser. No. 715,703
Int. Cl.[2] G06F *15/42, 15/34*
U.S. Cl. 364—553 **12 Claims**



1. Apparatus for determining the characteristics of a system to which there is applied a band-limited white-noise signal, *x*, in response to which a *y* output signal is produced, said apparatus comprising:

means for establishing sampling intervals of said *y* output signal,

means for quantizing an *x* signal during a sampling interval into a ternary signal,

means for converting a sample of said *y* output signal to digital signals including a sign signal during a sampling interval,

means for storing a predetermined number of said ternary signals,

means for sequentially combining the stored ternary signals and the sign of said *y* digital signal to provide an add, subtract or skip instruction signal,

an arithmetic means responsive to instruction signals for adding, or subtracting or skipping signals applied to its two inputs, and then in response to each instruction signal providing a sum, or difference output, or one of its inputs as an output,

accumulator memory means for successively storing each output of said arithmetic means,

means for applying to one input of said arithmetic means the most recent output from said arithmetic means,

means for applying said *y* digital signals to the other input to said arithmetic means whereby said arithmetic unit adds, or subtracts its inputs, or does neither, in response to said instruction signals, and

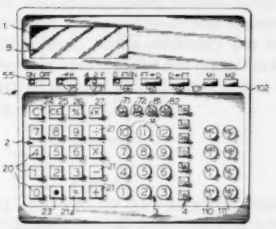
means for displaying the contents of said accumulator memory means.

4,081,859

ELECTRONIC CALCULATOR FOR FEET-INCH-FRACTION NUMERICS

Alan B. Goldsamt, Banksville Rd., Greenwich, Conn. 06830, and Earl Greenberg, 9-20 166th St., Whitestone, N.Y. 11357

Continuation-in-part of Ser. No. 507,621, Sep. 19, 1974, Pat. No. 3,973,113. This application Jun. 4, 1976, Ser. No. 692,757
Int. Cl.[2] G06F *3/02, 5/02*
U.S. Cl. 364—709 **12 Claims**



1. A computing apparatus contained with a housing, comprising:

a display console consisting of displays to record the results of specified computations;

a first keyboard having a plurality of character keys representing the digits "0" through "9";

primary function keys representing the arithmetic functions of addition, subtraction, multiplication and division;

a key representing an "equals" function;

a key representing a decimal point;

a key representing a "clear all" function;

a key representing a "clear last entry" function;

a key representing a percent function;

a key representing a square foot function;

a second keyboard having a plurality of character keys with the 12 character keys representing the digits "1" through "12" representing, respectively, one through 12 inches;

a third keyboard having a plurality of character keys with the character keys representing the identified fractions of $\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$ and $\frac{7}{8}$;

an array of switches, including an "on/off" switch, a constant switch, a decimal selector switch, an operation selector switch;

conversion keys, including a feet-to-decimal conversion key, a decimal-to-feet conversion key, a feet-to-meters conversion key, a meters-to-feet conversion key, an inches-to-centimeters conversion key, a centimeters-to-inches conversion key;

converting means actuated by said conversion keys for effecting the associated conversions;

memory means for storing numerics;

memory utilization means, including a plurality of keys representing the "memory" functions of entering positive numerics into memory, entering negative numerics into memory, recalling numerics entered into memory, clearing numerics entered into memory;

means for automatically performing the function of taking a percentage of a numeric entered in the apparatus and recording the number in the displays, when said numeric is "feet," "inches," "fractions of an inch" and when said numeric is a decimal numeric, wherein said percentage taking means further includes means for automatically recording in the displays the result of said function of taking a percentage;

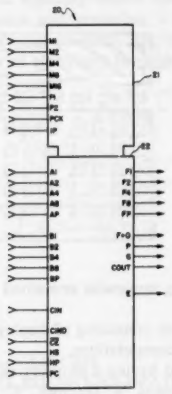
an indicator light to indicate when numerics have been entered into a memory;
an indicator light to indicate when numerics have been entered into another memory; and
a power source for driving the computing apparatus.

4,081,860

CURRENT MODE 4-BIT ARITHMETIC LOGIC UNIT WITH PARITY

Homer Warner Miller, Peoria, Ariz., assignor to Honeywell Information Systems Inc., Phoenix, Ariz.

Filed Jan. 3, 1977, Ser. No. 756,458
Int. Cl.[2] G06F *11/10*
U.S. Cl. 364—738 **2 Claims**



1. A current mode 4-bit arithmetic logic unit for performing a repertoire of binary arithmetic and logic operations on two *n*-bit plus parity input bytes Ai and Bi, where $0 < n \leqq 4$, said arithmetic logic unit further performing parity prediction, parity checking, and carry checking operations, said arithmetic logic unit comprising:

a first portion for receiving said first and second *n*-bit bytes A*i* and B*i*, a carry-in signal CIN, a mode control signal, and generating a binary output resultant signal F*i* in response to said mode control signal; and

a second portion receiving said carry-in signal CIN, a carry-in duplicate signal CIND, and the parity bits AP and BP associated with said first and second *n*-bit bytes, said second portion further receiving as inputs thereto a carry error signal CE, a parity of the half-sums signal HS, a parity of the half parities signal HP, an invert parity signal IP, a parity check signal PCK, a pair of configuration select signals P1 and P2, and a parity of the carries signal PC from an external source, said second portion generating a parity prediction signal FP and error signal E in accordance with the following logic equations:

Parity (FP) and Error (E) Outputs:

$$FP = \}CIN\cdot[HS1\cdot K2) + (HS2\cdot K4\cdot(HS4\cdot K8))]\cdot M16\}$$

$$\oplus \{G1\cdot K2\cdot[(HS2\cdot K4) + (HS4\cdot k8)]\cdot M16\}$$

$$\oplus \{G2\cdot K4\cdot(HS4\cdot K8)\cdot M16\}$$

$$\oplus \{G4\cdot K8\cdot M16\}$$

$$\oplus \{IP\}$$

$$\oplus \{PC\}$$

$$\oplus \{HS \oplus HS1 \oplus (HS2\cdot K2) \oplus (HS4\cdot K4) \oplus (HS8\cdot K8)\}$$

$$E = \{(CIN \oplus CIN)\cdot M16\} + \{CE\} + \}[AP \oplus BP\}$$

$$\oplus [HS \oplus HS1 \oplus (HS2\cdot K2) \oplus (HS4\cdot K4) \oplus (HS8\cdot K8)]$$

$$\oplus [HP \oplus HP1 \oplus (HP2\cdot K2) \oplus (HP4\cdot K4) \oplus (HP8\cdot K8)] \cdot PCK$$

$$K2 = P2 + P1$$

$$K4 = P2$$

$$K8 = P2\cdot P1$$

Half Sum, Half Parity, Propagates, and Generates Intermediate Signals (HS*i*, HP*i*, P*i*, PP*i*, G*i*, GP*i*):

Half Sum, Half Parity, Propagates, and Generates Intermediates Signals (HSi, HPi, Pi, PPi, Gi, GPi):

For i = 1,2,4,8

$Gi = M8\cdot Ai\cdot Bi + N4\cdot Ai\cdot \overline{Bi}$ $\quad GPi = M8\cdot Bi\cdot Ai + M1\cdot Bi\cdot \overline{Ai}$

$Pi = Ai + M2\cdot \overline{Bi} + M1\cdot Bi$ $\quad PPi = Bi + M2\cdot \overline{Ai} + M4\cdot Ai$

$HSi = \overline{Gi}\cdot Pi$ $\quad HPi = \overline{GPi}\cdot PPi$

M8	M4	M2	M1	HSi	HPi
0	0	0	0	Ai	Bi
0	0	0	1	Ai + $\overline{Bi}$	Ai·Bi
0	0	1	0	Ai + $\overline{Bi}$	$\overline{Ai}$ + Bi
0	0	1	1	1	Ai $\overline{\oplus}$ Bi
0	1	0	0	Ai·Bi	Ai + Bi
0	1	0	1	$\overline{Bi}$	Ai
0	1	1	0	Ai $\overline{\oplus}$ Bi	1
0	1	1	1	$\overline{Ai}$ + Bi	Ai + $\overline{Bi}$
1	0	0	0	Ai·$\overline{Bi}$	$\overline{Ai}$·Bi
1	0	0	1	Ai ⊕ Bi	0
1	0	1	0	$\overline{Bi}$	$\overline{Ai}$
1	0	1	1	$\overline{Ai}$ + $\overline{Bi}$	$\overline{Ai}$·$\overline{Bi}$
1	1	0	0	0	Ai ⊕ Bi
1	1	0	1	$\overline{Ai}$·Bi	Ai·$\overline{Bi}$
1	1	1	0	$\overline{Ai}$·$\overline{Bi}$	$\overline{Ai}$ + $\overline{Bi}$
1	1	1	1	$\overline{Ai}$	$\overline{Bi}$

Carry Intermediate Signals (Ci):

C1 = CIN

C2 = G1 + HS1·CIN

C4 = G2 + HS2·G1 + HS2·HS1·CIN

C8 = G4 + HS4·G2 + HS4·HS2·G1 + HS4·HS2·HS1·CIN

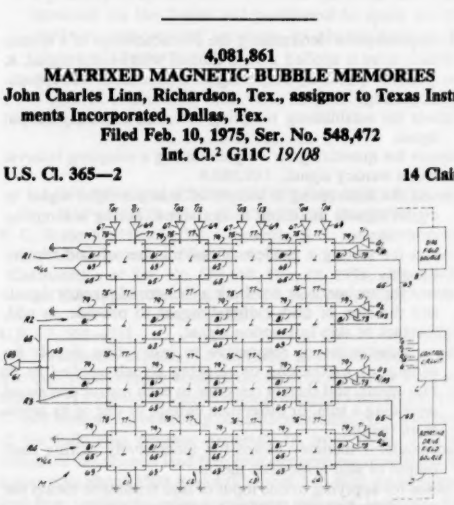
P2	P1	K8	K4	K2	# of Active Bits n in ALU
0	0	0	0	0	1
0	1	0	0	1	2
1	0	0	1	1	3
1	1	1	1	1	4

4,081,861

MATRIXED MAGNETIC BUBBLE MEMORIES

John Charles Linn, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Feb. 10, 1975, Ser. No. 548,472
Int. Cl.[2] G11C *19/08*
U.S. Cl. 365—2 **14 Claims**



1. A magnetic bubble memory organization, comprising:

a plurality of magnetic bubble memory chips arranged in rows and columns to form a matrix, each chip having:

a plurality of memory locations for storing magnetic bubbles;

means for selectively transferring magnetic bubbles out of and into said memory locations for the retrieval and storage of information;

means for selectively replicating and annihilating magnetic bubble information transferred out of memory locations on said chip,

means for selectively generating magnetic bubbles for storage in memory locations on said chip, and

means for detecting the presence of magnetic bubbles transferred out of memory locations and for providing an electrical output signal in response to the detection thereof,

means for supplying transfer electrical control signals to be respectively commonly applied to the transfer means on all chips in each of the respective columns of the matrix for the simultaneous actuation thereof;

means for supplying replicate and annihilate electrical control signals to be respectively commonly applied to the replication and annihilation means on all chips in each of the respective rows of the matrix for the simultaneous actuation thereof;

means for supplying generate control signals to be respectively commonly applied to the generating means on all chips in each of the respective rows of the matrix for the simultaneous actuation thereof;

means for synchronizing the movement of magnetic bubbles in all the chips; and

a single circuit commonly connecting the detecting means of each chip in the matrix for conveying retrieved information out of said matrix whereby the memory locations of any magnetic bubble memory chip in the matrix may be selectively accessed for the storage and retrieval of information using a minimum number of control signal supplying means for all the chips in the matrix and only a single output circuit.

4,081,862

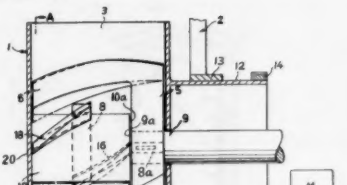
MIXING MACHINE

John Charles Hucklesby; Raymond Arthur Lilley, and Ronald Henry Jackson, all of Peterborough, England, assignors to Baker Perkins Chemical Machinery Limited, Peterborough, England

Continuation-in-part of Ser. No. 624,553, Oct. 21, 1975, abandoned. This application Mar. 25, 1977, Ser. No. 781,144

Int. Cl.[2] B01F *7/08*

U.S. Cl. 366—99 **5 Claims**



1. A mixing machine comprising means defining a chamber of generally U-shaped cross section having an internal surface, a portion of which internal surface is in the form of a portion of a cylinder, a stationary cylindrical central core projecting coaxially into said chamber from one end thereof in coaxial relationship with the cylindrical wall portion of said chamber to a location adjacent the opposite end of said chamber, a rotatable drive shaft mounted at the opposite end of said chamber for rotation in closely spaced coaxial relationship with said core, a first generally helical mixing element mounted at one end upon said shaft for rotation therewith and extending axially from said shaft to a location adjacent said one end of said chamber, said first mixing member closely surrounding said core and being adapted to sweep the surrounding of said core upon rotation of said drive shaft, a second mixing element mounted at one end upon said shaft for rotation therewith and extending axially from said shaft to a location adjacent said one end of said chamber, said second mixing element being adapted to sweep the cylindrical wall portion of said chamber upon rotation of said drive shaft, and a stationary pin extending axially into said chamber from said one end thereof at a locaton between the respective paths of rotary travel of said first and said second mixing elements.

4,081,863

METHOD AND VALVE APPARATUS FOR HOMOGENIZING FLUID EMULSIONS AND DISPERSIONS AND CONTROLLING HOMOGENIZING EFFICIENCY AND UNIFORMITY OF PROCESSED PARTICLES

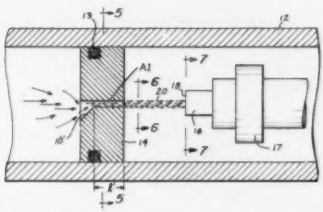
Lancelot H. Rees, Westwood, Mass., assignor to Gaulin Corporation, Everett, Mass.

Filed Jul. 15, 1976, Ser. No. 705,475

Claims priority, application United Kingdom, Jul. 23, 1975, 30859/75

Int. Cl.[2] B01F *15/02, 5/06*

U.S. Cl. 366—176 **5 Claims**

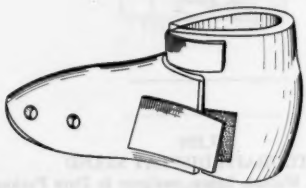


1. In a method of homogenizing fluid emulsions and dispersions, the steps which include introducing pressurized fluid in a range of pressures of from about 600 p.s.i up to 12,000 p.s.i. into a homogenizing valve member having a homogenizing aperture characterized by similar inlet and outlet openings and a connecting passageway whose cross sectional area is constant at all points therealong, said passageway being in the form of a slit and one of the wall portions defining the slit being adjustable with respect to an opposite wall portion, conducting the pressurized fluid through the passageway of constant cross sectional area to produce an energy release which is substantially free from radial divergence and which is a function of the length of said passageway the spacing of opposite wall portions thereof, and pressure exerted, and discharging the energized fluid from the outlet opening along a substantially linear path of flow, to provide homogenizing efficiency which is substantially constant throughout an extended range of flow rates.

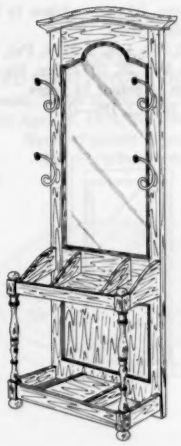
DESIGNS

MARCH 28, 1978

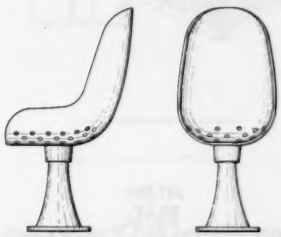
247,591
FOOT PROTECTING DEVICE
Pu Gill Gwon, Florissant, Mo., assignor to Pro-Tect, Inc., St. Louis, Mo.
Filed May 19, 1976, Ser. No. 687,898
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—271



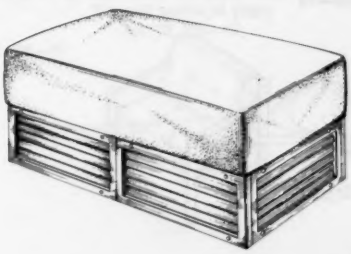
247,592
HALL TREE
Leonard Eisen, 14 Lomas La., Montvale, N.J. 07645
Filed Aug. 13, 1975, Ser. No. 604,326
Term of patent 7 years
Int. Cl. D6—*04*
U.S. Cl. D6—19



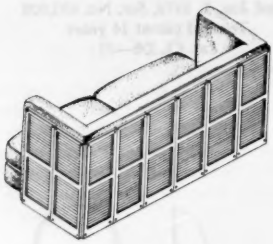
247,593
SHOWER BATH CHAIR
Rebecca D. Steele, 1117 E. Monument, Colorado Springs, Colo. 80903
Filed Jun. 1, 1976, Ser. No. 692,008
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—26



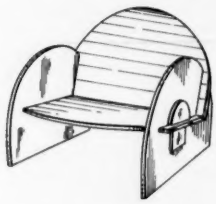
247,594
FOOTSTOOL
Lee A. Corson, Great Neck, N.Y., and Robert S. Corson, Pottstown, Pa., assignors to Crestline Furniture Company
Filed Sep. 14, 1976, Ser. No. 723,219
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—36



247,595
SOFA
Lee A. Corson, Great Neck, N.Y., and Robert S. Corson, Pottstown, Pa., assignors to Crestline Furniture Company
Filed Sep. 14, 1976, Ser. No. 723,220
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—63



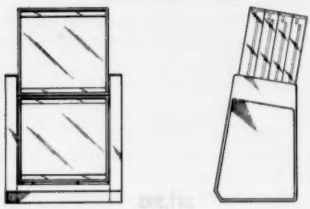
247,596
SEAT
Osamu Hashimoto, 5601 Blvd. East, West New York, N.J. 07093
Filed May 27, 1976, Ser. No. 690,642
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—71



247,597
SEAT
Harold Glaser, St. Louis County, Mo., assignor to James David Incorporated, Maryland Heights, Mo.
Filed Mar. 30, 1977, Ser. No. 782,944
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—73

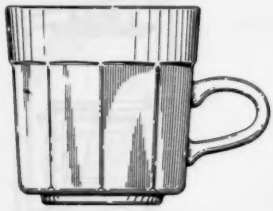
247,598
DATE DISPLAY STAND
Raymond Joseph Kearney, 6305 Vista Del Mar, Playa del Rey, Calif. 90291
Filed May 17, 1976, Ser. No. 687,307
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—188

247,599
PHOTOGRAPH DISPLAY STAND
George F. Lyman, Weston, Mass., assignor to Data Packaging Corporation, Cambridge, Mass.
Division of Ser. No. 712,023, Aug. 5, 1976, Pat. No. D. 245,305.
This application Apr. 28, 1977, Ser. No. 792,023
Term of patent 14 years
Int. Cl. D6—*07*
U.S. Cl. D6—234

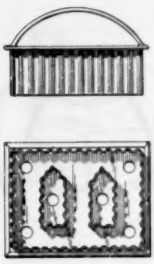


247,600
PHOTOGRAPH DISPLAY STAND
George F. Lyman, Weston, Mass., assignor to Data Packaging Corporation, Cambridge, Mass.
Division of Ser. No. 712,023, Aug. 5, 1976, Pat. No. D. 245,305.
This application Apr. 28, 1977, Ser. No. 792,041
Term of patent 14 years
Int. Cl. D6—*07*
U.S. Cl. D6—234

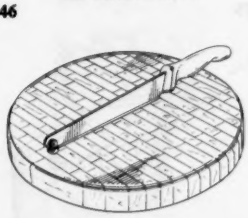
247,601
CUP
Don Schreckengost, East Liverpool, Ohio, assignor to The Salem China Company, Salem, Ohio
Filed Oct. 7, 1976, Ser. No. 730,154
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—9



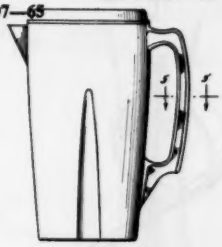
247,602
DOUGH CUTTER
Barbara Williams, 642 N. Sierra Vista, Fresno, Calif. 93702
Filed Sep. 26, 1977, Ser. No. 836,274
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D7—43



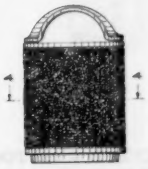
247,603
COMBINED CHOPPING BLOCK AND KNIFE
Milton J. Grossman, 12804 E. Penn St., Whittier, Calif. 90602
Filed Apr. 26, 1976, Ser. No. 680,135
Term of patent 14 years
Int. Cl. D7—*04, 03*
U.S. Cl. D7—46



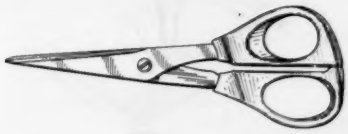
247,604
COVERED PITCHER
Leo F. Wildgen, Minneapolis, Minn., assignor to Bail Corporation, Muncie, Ind.
Filed Feb. 6, 1976, Ser. No. 655,947
The portion of the term of this patent subsequent to Nov. 22, 1991, has been disclaimed.
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—65



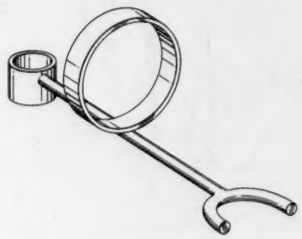
247,605
CONCRETE TRASH CONTAINER
James E. Miller, Birmingham, Mich., assignor to Form, Incorporated, South Lyon, Mich.
Filed Jun. 21, 1976, Ser. No. 698,166
Term of patent 14 years
Int. Cl. D7—*07*
U.S. Cl. D7—189



247,606
SCISSORS
Carl-Arne Breger, Malmo, Sweden, assignor to Dyno Merchandise Corporation, Ft. Lauderdale, Fla.
Filed May 10, 1976, Ser. No. 684,681
Claims priority, application Germany, Nov. 12, 1975, 8585
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—57

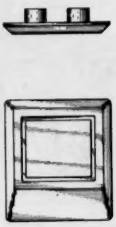


247,607
STABILIZING ATTACHMENT FOR AN ELECTRIC DRILL
Michael Schneider, Sr., 1120 S. Union Ave., Alliance, Ohio 44601
Filed Sep. 28, 1976, Ser. No. 727,511
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—70

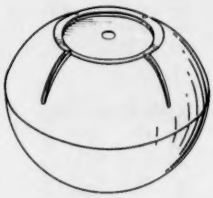


247,608
SCULPTURING TOOL
Anne T. Amiot, 27177 Simone, Dearborn Heights, Mich. 48127
Filed Jul. 23, 1976, Ser. No. 708,193
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—98

247,609
HINGE FACE PLATE FOR GLASS DOORS
Robert Eugene Triplette, Winston-Salem, N.C., assignor to Southern Tool Mfg. Co., Inc., Winston-Salem, N.C.
Filed Mar. 18, 1976, Ser. No. 668,166
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D8—323

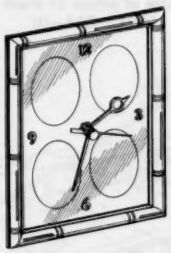


247,610
PACKAGING CONTAINER FOR SEEDS OR THE LIKE
Peter W. Stanley, 167 Cranston Ct., Glen Ellyn, Ill. 60137
Filed Oct. 20, 1975, Ser. No. 624,252
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—237

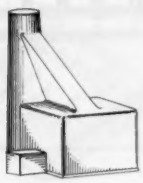


247,611
DISPENSING CLOSURE WITH POURING SPOUT
Geoffrey Alan Giles, Reading, England, assignor to Metal Box Limited, Reading, England
Filed Apr. 1, 1976, Ser. No. 672,775
Claims priority, application United Kingdom, Oct. 27, 1975, 973016/75
Term of patent 14 years
Int. Cl. D9—*07*
U.S. Cl. D9—275

247,612
PICTURE CLOCK
John C. Lucich, 12835 Sundance Ave., San Diego, Calif. 92129
Filed Apr. 5, 1976, Ser. No. 673,625
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D10—2



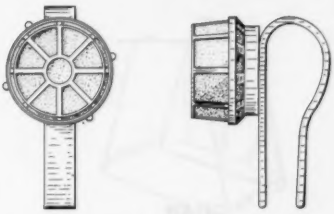
247,613
HOOD FOR CONVEYING AND WEIGHING SYSTEM IN AN ANIMAL FEEDER
James Mark Launder, 207 Louella, Nokomis, Fla. 33555
Filed Nov. 11, 1975, Ser. No. 631,124
The portion of the term of this patent subsequent to Nov. 30, 1990, has been disclaimed.
Term of patent 14 years
Int. Cl. D10—*99*
U.S. Cl. D10—94



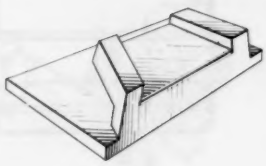
247,614
EARRING
Pepi G. Kelman, 19264 Pacific Coast Hwy., Malibu, Calif. 90265
Division of Ser. No. 637,852, Dec. 5, 1975, Pat. No. Des. 242,573. This application Nov. 5, 1976, Ser. No. 739,321
The portion of the term of this patent subsequent to Nov. 30, 1990, has been disclaimed.
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—75

247,615
MEDALLION
James M. Linick, 4613 N. Clark Ave., Tampa, Fla. 33614
Filed Jan. 21, 1976, Ser. No. 650,990
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—96

247,616
FLOWER HOLDER FOR PEWS
Gene Meyer, 12 Quay Ct., Centerport, N.Y. 11721
Filed Feb. 10, 1977, Ser. No. 767,287
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—146

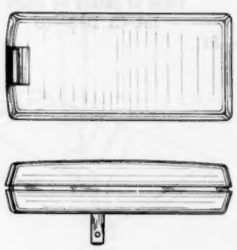


247,617
RAIL INSULATING PAD
Albert Edward Rex, Adelaide, Australia, assignor to A.E. Rex Nominees Pty. Ltd.
Filed Apr. 8, 1976, Ser. No. 674,973
Claims priority, application Australia, Oct. 8, 1975, 67900/75
Term of patent 14 years
Int. Cl. D12—*03*
U.S. Cl. D12—51

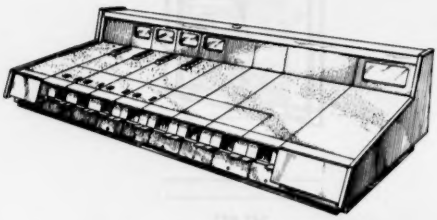


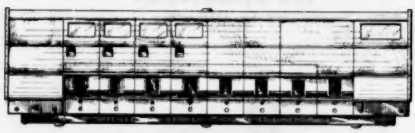
247,618
STROLLER
Curtis Albert Sparkes, Altrincham, England, assignor to Lamondine S.A., Switzerland
Filed Apr. 5, 1976, Ser. No. 673,918
Claims priority, application United Kingdom, Oct. 6, 1975, 972790/75; Oct. 6, 1975, 972791/75
Term of patent 14 years
Int. Cl. D12—*12*
U.S. Cl. D12—129

247,619
RECHARGEABLE BATTERY PACK
James E. Edgell, Senatobia, Miss.; Lynn D. Lineback, and William H. Russell, both of Danville, Va., assignors to Disston, Inc., Pittsburgh, Pa.
Continuation of Ser. No. 684,794, May 10, 1976, abandoned, and Ser. No. 684,795, May 10, 1976, abandoned. This application Oct. 26, 1976, Ser. No. 735,638
Term of patent 14 years
Int. Cl. D13—*02*
U.S. Cl. D13—11



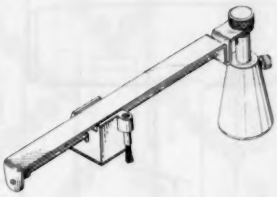
247,620
APPARATUS FOR MONITORING REMOTE TRANSCRIBING OPERATIONS IN A CENTRAL DICTATION SYSTEM
Arthur J. Pulos, Fayetteville; Michael Cridland, Manlius, both of N.Y., and Steven Wagner, Brighton, Mass., assignors to Dictaphone Corporation, Rye, N.Y.
Filed Oct. 17, 1975, Ser. No. 623,340
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—1



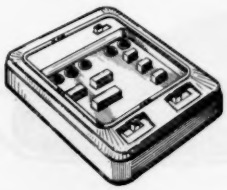


247,621
DESK-TOP MICROPHONE UNIT
Robert Podall, 670 Pfingsten, Northbrook, Ill. 60062
Filed Apr. 1, 1977, Ser. No. 783,856
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—12

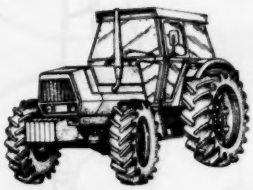
247,622
CLEANING ARM FOR PHONOGRAPH RECORDS
Philip Brian Arbib, Chalfont St. Peter, and Douglas Charles Bruce, Barkway near Royston, both of England, assignors to Bib Hi-Fi Accessories Ltd., Hemel Hempstead, England
Filed Aug. 18, 1976, Ser. No. 715,569
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—27



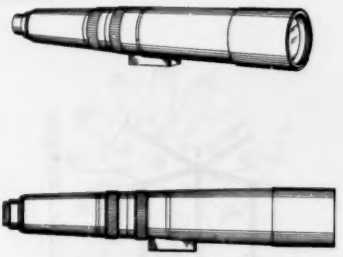
247,623
COMPUTER
Walter L. Pulvers, P.O. Box 4144, Anaheim, Calif. 92803
Filed Sep. 3, 1976, Ser. No. 720,110
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—45



247,624
TRACTOR
Horst Emundts, Cologne, and Peter Kramer, Troisdorf-Spich, both of Germany, assignors to Klockner-Humboldt-Deutz Aktiengesellschaft, Cologne, Germany
Filed Apr. 15, 1976, Ser. No. 677,293
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D15—23

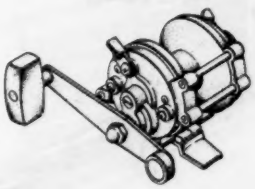


247,625
TELESCOPE
Claus O. Huckenbeck, Sherman Oaks, Calif., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.
Filed Mar. 29, 1976, Ser. No. 671,348
Term of patent 14 years
Int. Cl. D16—*08*; D22—*02*
U.S. Cl. D16—61



247,626
COMBINED FILE HOLDER AND WRITING INSTRUMENT POCKET
George Henry Wiseman Riches, Toronto, Canada, assignor to George Henry Wiseman Riches and Hester Edna Riches, Toronto, Canada, part interest to each
Filed Jan. 7, 1976, Ser. No. 647,164
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—90

247,627
FISHING REEL
Kinjirou Takeuchi, Tokyo, Japan, assignor to Takeuchi Seisakusho, Ltd., Tokyo, Japan
Filed Mar. 16, 1977, Ser. No. 778,060
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—25



247,628
BLANK FOR A CONTAINED VENT AND INSULATION BAFFLE
Bruce K. Ward, 2904 Virginia Ave., St. Louis Park, Minn. 55426
Filed Dec. 1, 1976, Ser. No. 746,526
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—137

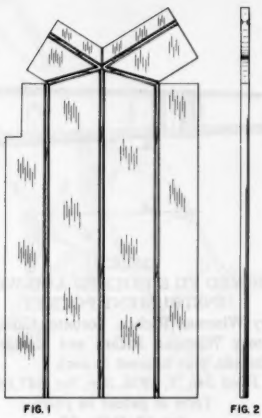
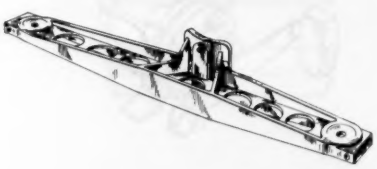
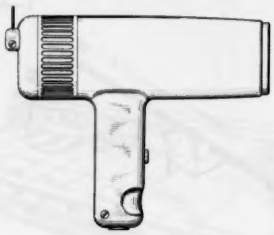


FIG. 1 FIG. 2

247,629
UTILITY POLE CROSS ARM
Roland K. Grannis, San Mateo, Calif., assignor to Pacific Utilities Supply Co., San Francisco, Calif.
Filed Mar. 24, 1976, Ser. No. 670,681
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—77

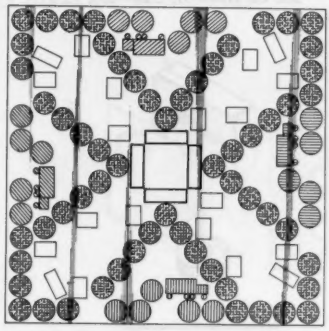


247,630
DRYER
John Wistrand, New Canaan, Conn., assignor to Clairol Incorporated, New York, N.Y.
Filed Apr. 23, 1976, Ser. No. 680,001
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—13



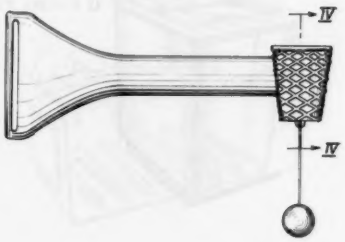
247,631
SUPPORT FOR NEWLY CROPPED DOG EARS
Richard D. Shannon, 10510 Barnhart Ct., Cupertino, Calif. 95014
Filed Aug. 1, 1975, Ser. No. 601,227
Term of patent 14 years
Int. Cl. D30—*99*
U.S. Cl. D30—40

247,632
GAMEBOARD
Larry R. Godard, 175 Miramar St., Camarillo, Calif. 93010
Filed May 24, 1976, Ser. No. 689,507
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 SS



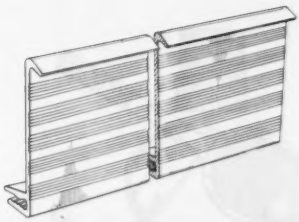
247,633
GOLF CLUB HEAD
Ralph B. Shaw, 91 Overlook Dr., Manchester, Conn. 06040
Filed Nov. 1, 1976, Ser. No. 737,391
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 GH

247,634
BODY ATTACHED TETHERED BALL GAME GOAL
David E. Smith, 206 Hankey Farms Dr., Oakdale, Pa. 15071, and Gordon C. Gravelle, 899 Cherry St., Pittsburgh, Pa. 15205
Filed Jul. 6, 1976, Ser. No. 702,334
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 P

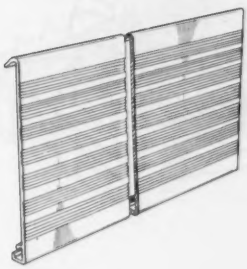


247,635
BUOYANT WICK HOLDER
Donald James Maxwell, London, England, assignor to Rizla Limited, Pontypridd, Wales
Filed May 13, 1976, Ser. No. 685,747
Claims priority, application United Kingdom, Nov. 27, 1975, 973266/75
Term of patent 14 years
Int. Cl. D26—*01*
U.S. Cl. D48—2

247,636
SIDE PANEL FOR CEILING LIGHTS
Murray M. Win, Los Angeles, Calif., assignor to Malcolite Corporation, Monterey Park, Calif.
Filed Oct. 27, 1976, Ser. No. 736,134
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—16 A

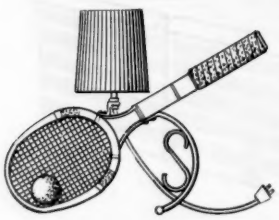


247,637
WIDE SIDE PANEL FOR CEILING LIGHTS
Murray M. Win, Los Angeles, Calif., assignor to Malcolite Corporation, Monterey Park, Calif.
Filed Oct. 27, 1976, Ser. No. 736,138
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—16 A



247,638
LAMP BASE
George E. Kreusler, 22441 Alpine Way, Palm Springs, Calif. 92262
Filed Jun. 21, 1976, Ser. No. 697,834
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—20 R

247,639
LAMP
Joseph A. Ponce, Sr., 617 Ash St., Waukegan, Ill. 60085
Filed Oct. 1, 1976, Ser. No. 728,633
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—20 C

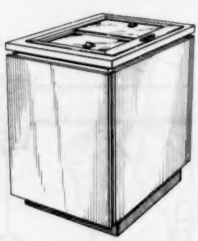


247,640
POINT-OF-SALE TERMINAL
Luigi Di Benedetto, El Segundo, Calif., assignor to TRW Inc.
Filed Dec. 29, 1975, Ser. No. 645,228
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D52—4 A

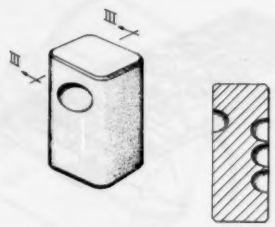
247,641
AMOUNT DISPLAY HOUSING FOR CASH REGISTER OR THE LIKE
John G. Clary, 2850 Thorndike Rd., Pasadena, Calif. 91107, and David Weinkle, 6057 James Alan St., Cypress, Calif. 90630
Filed Oct. 18, 1976, Ser. No. 733,453
Term of patent 14 years
Int. Cl. D18—*01*; D20—*03*
U.S. Cl. D52—4 A

247,642
VIOLIN SHOULDER REST
William J. Watson, 7526 El Morro Rd., NE., Albuquerque, N. Mex. 87109
Filed Jul. 9, 1976, Ser. No. 703,757
Term of patent 14 years
Int. Cl. D17—*03*
U.S. Cl. D56—1 A

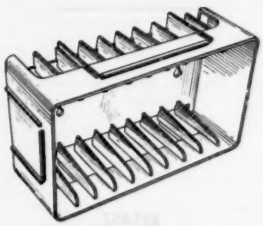
247,643
TELEPRINTER CONSOLE
Leonard R. Aremka, Chicago, Ill.; Donald M. Genaro, Haworth, N.J.; Arthur A. Hagstrom, and Barry L. Shevick, both of Hoffman Estates, Ill., assignors to Teletype Corporation, Skokie, Ill.
Filed Nov. 10, 1975, Ser. No. 630,108
Term of patent 14 years
Int. Cl. D18—*02*
U.S. Cl. D64—11 R



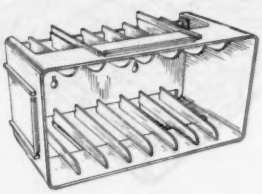
247,644
BAR OF SOAP
Bernard H. Berman, 685 N. Wade Ave. Extension, Washington, Pa. 15301
Filed May 5, 1976, Ser. No. 683,430
Term of patent 14 years
Int. Cl. D28—*02*
U.S. Cl. D73—1 A



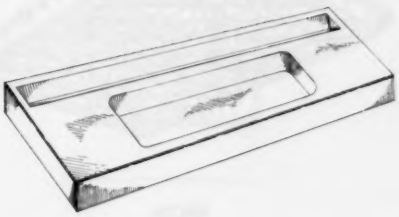
247,645
STORAGE RACK FOR MAGNETIC TAPE CASSETTES
Michael Baden Woodhall, Maidenhead, England, assignor to Cambra Cases Limited, London, England
Filed Dec. 9, 1975, Ser. No. 639,181
Term of patent 7 years
Int. Cl. D3—*02*
U.S. Cl. D87—1 D



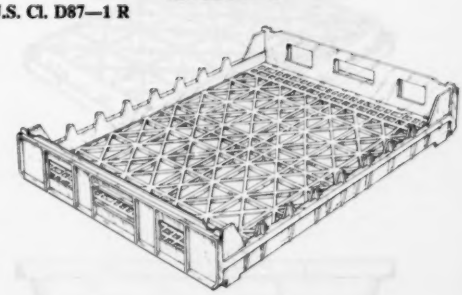
247,646
STORAGE RACK FOR MAGNETIC TAPE CARTRIDGES
Michael Baden Woodhall, Maidenhead, England, assignor to Cambra Cases Limited, London, England
Filed Dec. 9, 1975, Ser. No. 639,182
Term of patent 7 years
Int. Cl. D3—*02*
U.S. Cl. D87—1 D



247,647
TRAY FOR DESIGNING BEADED JEWELRY
Sally H. Huber, 69 Pioneer Dr., West Hartford, Conn. 06117
Filed Jun. 1, 1976, Ser. No. 691,379
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D87—1 R



247,648
BAKERY CONTAINER OR THE LIKE
James C. Carroll, and Lewis T. Johnson, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.
Filed Jul. 6, 1976, Ser. No. 703,026
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D87—1 R

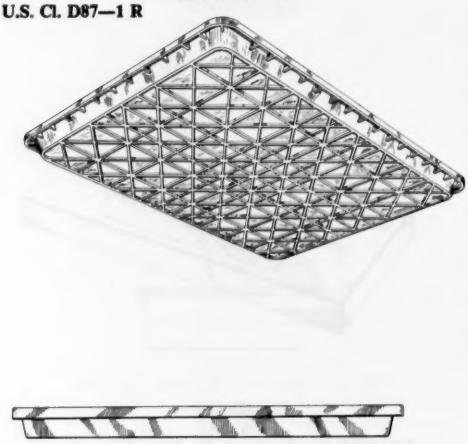


247,649

BAKERY TRAY OR THE LIKE

James C. Carroll, Hopkinsville, Ky., and Lewis T. Johnson, Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 18, 1976, Ser. No. 715,252
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D87—1 R

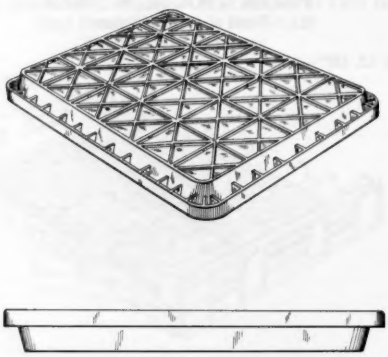


247,650

BAKERY TRAY OR THE LIKE

James C. Carroll, Hopkinsville, Ky., and Lewis T. Johnson, Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 18, 1976, Ser. No. 715,253
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D87—1 R

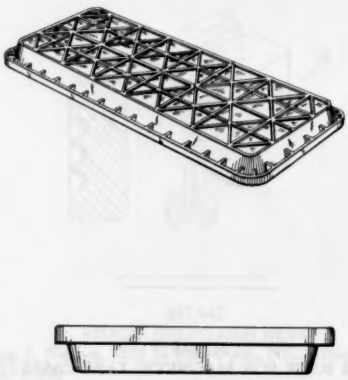


247,651

BAKERY TRAY OR THE LIKE

James C. Carroll, Hopkinsville, Ky., and Lewis T. Johnson, Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 18, 1976, Ser. No. 715,370
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D87—1 R

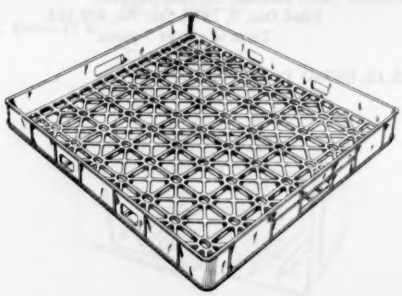


247,652

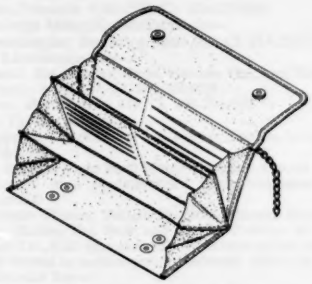
BAKERY CONTAINER OR THE LIKE

James C. Carroll, Hopkinsville, Ky., and Lewis T. Johnson, Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

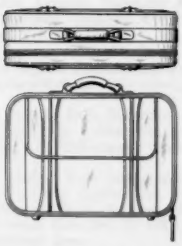
Filed Dec. 2, 1976, Ser. No. 745,881
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D87—1 R



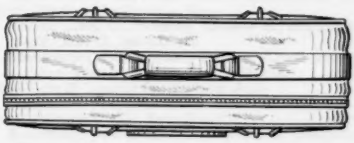
247,653
MULTICOMPARTMENT WALLET
Peter D. Kamenstein, 5 Pond La., Armonk, N.Y. 10504
Filed Oct. 24, 1975, Ser. No. 625,421
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D87—3 A



247,654
HAND LUGGAGE
Sol Koffler, Providence, R.I., assignor to American Luggage Works, Inc., Warren, R.I.
Filed Dec. 19, 1975, Ser. No. 642,585
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D87—5 G



247,655
HAND LUGGAGE
Sol Koffler, Providence, R.I., assignor to American Luggage Works, Inc., Warren, R.I.
Filed Dec. 19, 1975, Ser. No. 642,586
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D87—5 G



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 28TH DAY OF MARCH, 1978

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. Stephan U. Sohne GmbH & Co.: *See*—
Otto, Friedrich, 4,081,570, Cl. 426-629.000.

AB Norbergs Mekaniska Verkstad: *See*—
Hammarqvist, Bo Georg, 4,081,089, Cl. 214-38.0CC.

Abbott Laboratories: *See*—
Prasad, Raj Nandan; Stein, Herman Hal; and Tietje, Karin Rosemarie, 4,081,447, Cl. 260-288.00R.
Winn, Martin, 4,081,449, Cl. 260-293.580.

Abbott, Thomas Irving: *See*—
Chapman, Derek Davis; and Abbott, Thomas Irving, 4,081,275, Cl. 96-3.000.

Abdoo, Richard V., to Ford Motor Company. Circuit for detecting the occurrence of a predetermined input frequency. 4,081,694, Cl. 307-129.000.

Abe, Mitsuo; Murata, Tetsuo; Furuichi, Minoru; Shiraishi, Nobuhide; Wada, Shohei; Tai, Seiji; and Maeda, Tsukasa, to Japan Synthetic Rubber Co., Ltd. Hot melt adhesive composition for hot melt bonding of fibrous or surface-porous materials. 4,081,414, Cl. 260-23.70R.

Abe, Motoaki: *See*—
Aoki, Teruaki; Matsushita, Takeshi; Mifune, Tadayoshi; and Abe, Motoaki, 4,081,292, Cl. 148-1.500.

Abe, Takeshi: *See*—
Tsumura, Ryuichirou; Takaki, Usaji; and Abe, Takeshi, 4,081,472, Cl. 260-453.00P.

Aberg, Sven Ulrik Torbjorn; and Bergdahl, Sven Gunnar, to Molnlycke AB. Method for producing fluffed pulp. 4,081,316, Cl. 162-4.000.

Abex Corporation: *See*—
Frank, Earl E., 4,081,162, Cl. 246-458.000.

ACF Industries, Incorporated: *See*—
Randolph, Robert W.; and Jantzen, Steven L., 4,081,651, Cl. 219-61.000.

Ackel, Sabet, to Daimler-Benz Aktiengesellschaft. Floor tunnel structure for motor vehicles. 4,081,197, Cl. 296-28.00R.

Adamovske strojirny, narodni podnik: *See*—
Liska, Zbynek, 4,080,895, Cl. 101-218.000.

Adams, Dustin Stetson; Field, Frederick C., Jr.; and Layton, James Ronald, to Du Pont de Nemours, E. I., and Company. Direct spinning process for stretch-breaking continuous filaments to form entangled yarn. 4,080,778, Cl. 57-157.00S.

Adams, James Stephen: *See*—
Tichauer, Paul Arthur; Adams, James Stephen; and Thokar, Henry Desmont, 4,081,270, Cl. 75-60.000.

Addoms, John F.; and McGough, Charles B., to United States of America, Air Force. Dual manifold high performance throttleable injector. 4,081,136, Cl. 239-127.100.

Adlerborn, Jan, to ASEA Aktiebolag. Method for hot isostatic pressing powder bodies. 4,081,272, Cl. 75-223.000.

Adour Entreprise: *See*—
Azoulay, Edgard Elie Yves, 4,081,557, Cl. 426-18.000.

Advanced Filtration Equipment Corporation: *See*—
Smith, Edward A., 4,081,379, Cl. 210-232.000.

AGFA-Gevaert, A.G.: *See*—
Ender, Gunter; Schultz, Helmut; Thiele, Hartmut; Gruber, Leo; Kober, Heinrich; Bottcher, Werner; and Macheiner, Tibor, 4,081,151, Cl. 242-68.500.
Geyken, Erwin; and Dawidowitsch, Peter, 4,081,816, Cl. 354-324.000.

AGFA-GEVAERT N.V.: *See*—
Corluy, Hans Josephus; Schelfaut, Francois Leon; Nys, Pierre Herman; and Bortels, Raoul Jan, 4,081,280, Cl. 96-50.00A.
Vanassche, Willy Joseph; Pattyn, Herman Alberik; and Borginon, Hendrik Alfons, 4,081,281, Cl. 96-64.000.

Agrico Chemical Company: *See*—
MacKinnon, H. C., 4,081,266, Cl. 71-36.000.

Ahlberg, Erik Jan Krister, to Haldex Aktiebolag. Electronic taximeter having master-remote slave tariff and fare displays. 4,081,663, Cl. 364-467.000.

Ahlen, Karl Gustav, to S.R.M. Hydromekanik. Hydrodynamic torque converters. 4,080,786, Cl. 60-361.000.

Air Products & Chemicals, Inc.: *See*—
Block, Charles S.; Chen, Michael S.; Noichl, Olaf J.; and Hong, Sun-nan, 4,081,368, Cl. 210-14.000.

Aisin Seiki Kabushiki Kaisha: *See*—
Ogasawara, Tsunehiko, 4,080,977, Cl. 137-56.000.

Aizawa, Masuo: *See*—
Suzuki, Shuichi; Aizawa, Masuo; Ishigur, Isao; Shinohara, Rikio; and Nagamura, Yoichi, 4,081,334, Cl. 204-1.00T.

Aizawa, Tatsuo: *See*—
Nishihama, Hitoshi; Gotoda, Katsuhiko; Motomura, Minoru; Nakajima, Takanobu; and Aizawa, Tatsuo, 4,081,571, Cl. 427-18.000.

Akimoto, Hidetoshi: *See*—
Hishinuma, Yukio; Akimoto, Hidetoshi; Kaji, Ryuichi; Nakajima, Fumito; and Arikawa, Yoshijiro, 4,081,509, Cl. 423-235.000.

Akita, Sigeyuki; and Yoshida, Shuzo, to Nippon Soken, Inc. Liquid level detecting apparatus. 4,080,828, Cl. 73-308.000.

Akiyama, Hideo, to Nippon Electric Co., Ltd. Synchronizing signal separating circuit for television video signal processing. 4,081,833, Cl. 358-153.000.

Akiyama, Toyomi; Higaki, Taiji; Shiratsuchi, Eiichiro; and Tagami, Eijiro, to Japan Synthetic Rubber Co., Ltd.; and Kanzaki Paper Manufacturing Co., Ltd. Electrostatic recording material. 4,081,583, Cl. 428-457.000.

Akiyama, Toyomi; Higaki, Taiji; Shiratsuchi, Eiichiro; and Tagami, Eijiro, to Japan Synthetic Rubber Co., Ltd.; and Kanzaki Paper Manufacturing Co., Ltd. Electrostatic recording material and method for preparing the same. 4,081,584, Cl. 428-514.000.

Aktiebolaget Atomenergi: *See*—
Stenback, Erik Ake, 4,080,822, Cl. 73-40.700.

Aktiebolaget Karlstads Mekaniska Werkstad: *See*—
Wahren, Douglas; and Stenberg, Erik Gunnar, 4,081,320, Cl. 162-205.000.

Aktiebolaget Leo: *See*—
Fex, Hans Jacob; Kristensson, Sten Krister; and Stamvik, Anders Robert, 4,081,461, Cl. 260-397.400.

Aktiebolaget Skane-Emballage: *See*—
Johansson, Goran Lennart Daniel, 4,081,098, Cl. 215-329.000.

Akzona Incorporated: *See*—
Griset, Ernest J., Jr., 4,080,777, Cl. 57-140.00J.

Albanese, Andres, to Bell Telephone Laboratories, Incorporated. Automatic bias control circuit for injection lasers. 4,081,670, Cl. 250-199.000.

Albright & Wilson Limited: *See*—
Holmes, William Samuel; Lowe, Edward James; and Brazier, Ernest Reginald, 4,081,333, Cl. 203-86.000.

Alers, George A.: *See*—
Thompson, Robert B.; and Alers, George A., 4,080,836, Cl. 73-597.000.

Alexander, John D.; and Reed, Philip W., to Continental Oil Company. Sonic measurement of flow rate and water content of oil-water streams. 4,080,837, Cl. 73-61.10R.

Alfa-Laval AB: *See*—
Olander, Karl Erik, 4,080,995, Cl. 137-624.150.
Stroucken, Klaus H. D., 4,081,129, Cl. 233-20.00R.

Ali, Wahid R., to Texaco Trinidad Inc. Slow release fertilizers and processes for preparing same. 4,081,264, Cl. 71-28.000.

Allen, Gordon Hadfield; and Ray, Kenneth Irving, to Motorola, Inc. Base drive boost circuit for improved fall time in bipolar transistor logic circuits. 4,081,695, Cl. 307-209.000.

Allen, Irving, to Walter Kidde & Company, Inc. In-line crimping tool. 4,080,820, Cl. 72-410.000.

Allen, Kenneth Martin. Feed control system for multiple packaging machines. 4,081,044, Cl. 177-103.000.

Allen, Robert: *See*—
Clark, Jeremy; and Allen, Robert, 4,081,622, Cl. 179-81.00B.

Allied Chemical Corporation: *See*—
Anello, Louis G.; Sweeney, Richard F.; and Sukornick, Bernard, 4,081,487, Cl. 260-653.400.
Mendelsohn, Lewis Isaac; Durand, Kevin James; and Nesbitt, Ethan Allen, 4,081,298, Cl. 148-121.000.

Allied Tube & Conduit Corporation: *See*—
Tonkovich, Frank, 4,081,649, Cl. 219-61.100.

Allied Upholstery Mfg., Inc.: *See*—
Kanowsky, Vincent C.; and Canas, Raoul, 4,080,675, Cl. 5-345.00R.

Allis-Chalmers Corporation: *See*—
Schmidt, Harvey E.; Henry, Luke F.; Murphy, Howard G.; and Gilmore, Thomas P., 4,081,725, Cl. 318-139.000.

Almo Manifold and Tool Company: *See*—
Courson, Richard B.; and Piontkowski, Henry, 4,081,141, Cl. 239-551.000.

Altec Corporation: *See*—
Rumbaugh, Paul S., 4,081,757, Cl. 330-124.00R.

Alter, Hobart Laidlaw; and Blakely, Jerald Wayne, to Coast Catamaran Corporation. Roller furling mechanism. 4,080,917, Cl. 114-106.000.

Amemiya, Hiroshi; Tarui, Tadaaki; and Yoneyama, Tsuneo, to Tokyo Shibaura Electric Co., Ltd. Analog-to-digital converter. 4,081,800, Cl. 340-347.0NT.

American Can Company: *See*—
Meyers, George L., 4,081,125, Cl. 229-31.00R.

American Cyanamid Company: *See*—
Balsley, Richard Benjamin, 4,081,436, Cl. 260-156.000.
Barua, Girish Chandra; and Burkhard, Herbert, 4,081,418, Cl. 260-29.6MQ.

Casey, Donald J.; and Gleckler, George C., 4,080,969, Cl. 128-335.500.
Glickman, Leslie N., 4,081,230, Cl. 425-192.00R.
Grayson, Martin, 4,081,363, Cl. 209-166.000.
Maranci, Arutun, 4,081,498, Cl. 260-898.000.
Schmitt, Joseph Lawrence, Jr.; Waker, Philip Leroy, Jr.; and Castellion, George Augustus, 4,081,370, Cl. 210-39.000.
Werneke, Michael Francis; and Van Wyk, Joseph, 4,081,357, Cl. 209-5.000.

American Hoechst Corporation: *See—*
Horner, Ellwood J., 4,081,577, Cl. 427-424.000.
Horner, Ellwood J., 4,081,815, Cl. 354-319.000.
McFadden, Arthur Raymond; and Aultz, Daniel Eugene, 4,081,457, Cl. 260-332.20C.

American Home Products Corporation: *See—*
Sarantakis, Dimitrios, 4,081,433, Cl. 260-112.50S.

American Hydrocarbon Company: *See—*
Selin, Clifford E.; and Proell, Wayne A., 4,081,518, Cl. 423-400.000.

American Safety Equipment Corporation: *See—*
Henderson, Cyril, 4,081,152, Cl. 242-107.000.
Tanaka, Akira; and Ulrich, Charles, 4,081,153, Cl. 242-107.000.

Ames, Adolf; and Theler, Jean-Jacques, to Swiss Aluminium Ltd. Process and device for manufacturing extruded sections and similar items which are made in particular out of light weight metal. 4,080,816, Cl. 72-253.00R.

Ammann, Hans Hugo, to Bell Telephone Laboratories, Incorporated. Electrically heated soldering device. 4,081,658, Cl. 219-233.000.

AMP Incorporated: *See—*
Bunnell, Edward Dennman, 4,080,717, Cl. 29-566.400.
Hammond, James Woodrow; and Shughart, Mervin Leonard, 4,080,731, Cl. 29-715.000.

Amtower, Richard E.: *See—*
Harbaugh, Steven K.; and Amtower, Richard E., 4,081,842, Cl. 358-256.000.

Anaconda Company, The: *See—*
Pemberton, Denver L.; and Smith, Elmer E., 4,081,232, Cl. 425-463.000.

Anders, Dale F.: *See—*
Berenschot, Donald J.; Anders, Dale F.; and Hawker, Fred D., 4,081,416, Cl. 260-29.4UA.

Anders, Larry E.: *See—*
Sutton, Joel F.; Mattson, Allen R.; and Anders, Larry E., 4,081,137, Cl. 239-127.300.

Anderson-Cook, Inc.: *See—*
Anderson, Marvin R., 4,080,699, Cl. 29-90.00B.

Anderson, George H.; and Barrett, William J., to Barber-Colman Company. Automatic control system with integrator offset. 4,081,733, Cl. 318-610.000.

Anderson, Glenn W.: *See—*
Hutchison, Stanley O.; and Anderson, Glenn W., 4,081,032, Cl. 166-317.000.

Anderson, Harold Coulston: *See—*
Javes, Wallace Raymond; Hagberg, Calvin Andre; and Anderson, Harold Coulston, 4,081,645, Cl. 219-10.55B.

Anderson, Henry G. Vertically adjustable drinking fountain. 4,081,134, Cl. 239-30.000.

Anderson, Lowell M.; and Simmons, William D., to Simmons, William D., a part interest. Soil compaction system. 4,080,792, Cl. 61-35.000.

Anderson, Marvin R., to Anderson-Cook, Inc. Apparatus and method for burnishing gears. 4,080,699, Cl. 29-90.00B.

Anderson, Paul L.; and Brittain, Darryl A., to Sandoz, Inc. 1-Aryl-1-lower alkyl-1-buten-3-ols and ester derivatives. 4,081,476, Cl. 560-255.000.

Anderson, Ralph Francis, to B. F. Goodrich Company, The. Electrolytic cell liner and seal device. 4,081,348, Cl. 204-242.000.

Andersson, Sture R.; Blomberg, Jarl J.; and Elmessaar, Heino, to Atlas Copco Aktiebolag. Hand held impact device. 4,081,038, Cl. 173-162.000.

Andrews, Allen Howe: *See—*
Rhind, Terence Keith; Andrews, Allen Howe; Burdine, Warren Emil; and Hendrie, John Matthew, 4,081,780, Cl. 338-164.000.

Andrews, Merritt B., to United Technologies Corporation. Semi-spar wound blade. 4,081,220, Cl. 416-226.000.

Andrews, Merritt B., to United Technologies Corporation. Tripod bladed wind turbine. 4,081,221, Cl. 416-227.00A.

Andrews, Stanley R.: *See—*
White, Billy H.; and Griffin, William R., 4,081,115, Cl. 224-5.00E.

Anello, Louis G.; Sweeney, Richard F.; and Sukornick, Bernard, to Allied Chemical Corporation. Preparation of 1-chloro-2-trifluoromethyl-3,3,3-trifluoropropene from isobutane. 4,081,487, Cl. 260-653.400.

Annable, Richard V., to International Telephone and Telegraph Corporation. Hybrid gas cryogenic cooler. 4,080,802, Cl. 62-514.0JT.

Annen, Klaus: *See—*
Hofmeister, Helmut; Wiechert, Rudolf; Annen, Klaus; Laurent, Henry; and Steinbeck, Hermann, 4,081,537, Cl. 424-238.000.

Anthony, Thomas R.: *See—*
Cline, Harvey E.; and Anthony, Thomas R., 4,081,293, Cl. 148-1.500.

Anthony's Manufacturing Company, Inc.: *See—*
Heaney, James J., 4,080,756, Cl. 49-70.000.

Aoki, Teruaki; Matsushita, Takeshi; Mifune, Tadayoshi; and Abe, Motoaki, to Sony Corporation. Method of manufacturing a semi-insulating silicon layer. 4,081,292, Cl. 148-1.500.

Aoki, Tsutomu: *See—*
Uyeo, Shoichiro; Itani, Hikaru; Aoki, Tsutomu; Tsuji, Teruji; and Nagata, Wataru, 4,081,443, Cl. 260-239.100.

Aoyama, Tadamasa, to Aoyama, Tadamasa. Automatic positioning method and apparatus. 4,081,732, Cl. 318-603.000.

Appleby, Paul E.; Brinkley, Max D.; and Smith, Clement C., to Goodyear Tire & Rubber Company, The. Apparatus for grooving tires. 4,081,017, Cl. 157-13.000.

Applied Magnetics Corporation: *See—*
Roscamp, Thomas A.; Gibson, George W.; and Shelley, Pierre Anthony John Minton, 4,081,846, Cl. 360-103.000.

Applied Materials, Inc.: *See—*
McNeilly, Michael A.; Benzing, Walter C.; and Locke, Richard M., Jr., 4,081,313, Cl. 156-610.000.

AQM Corporation: *See—*
Walsh, Robert M.; and Droughton, John V., 4,080,667, Cl. 4-415.000.

Aqueduct, Inc.: *See—*
Lind, Charles F., Jr., 4,080,993, Cl. 137-504.000.

Arai, Akihiro: *See—*
Urano, Fumio; and Arai, Akihiro, 4,081,807, Cl. 354-152.000.

Arai, Tadashi. Antibiotic mimosamycin. 4,081,531, Cl. 424-121.000.

Arce, Henry Leyva: *See—*
Holland, Andrew MacDonald; and Arce, Henry Leyva, 4,080,919, Cl. 114-204.000.

Ardac, Inc.: *See—*
Sand, Edward Charles; and Lightner, Harold C., 4,081,131, Cl. 235-419.000.

Arendash, Joseph M.; and Okui, Yuji, to White Sewing Machine Company. Swing-open convertible arm for sewing machine. 4,080,913, Cl. 112-258.000.

Arikawa, Yoshijiro: *See—*
Hishinuma, Yukio; Akimoto, Hidetoshi; Kaji, Ryuichi; Nakajima, Fumito; and Arikawa, Yoshijiro, 4,081,509, Cl. 423-235.000.

Armco Steel Corporation: *See—*
Johnson, Thomas B.; and Leva, Larry D., 4,081,174, Cl. 251-327.000.

Armstrong, William W.; and Desai, Saurabhkumar J., to Pfizer Inc. Chlortetracycline compositions. 4,081,527, Cl. 424-80.000.

Armstrong, William W., to Pfizer Inc. Tetracycline compositions. 4,081,528, Cl. 424-80.000.

ARNCO: *See—*
Wyman, Ransome J.; and Gupta, Laxmi C., 4,081,429, Cl. 260-77.5AB.

Asahi Glass Company, Ltd.: *See—*
Matsumoto, Kuniharu; and Shinkai, Norihiko, 4,081,254, Cl. 65-116.000.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See—*
Urano, Fumio; and Arai, Akihiro, 4,081,807, Cl. 354-152.000.

Asahi Kogyo Co., Ltd.: *See—*
Hirai, Masaaki, 4,080,976, Cl. 135-25.00R.

Asakawa, Toshiro; Ishida, Atsuo; and Hayashi, Shizuo, to Kao Soap Co., Ltd. Dentifrice composition. 4,081,526, Cl. 424-57.000.

Asbury Industries, Inc.: *See—*
Frazzini, Thomas G., 4,080,746, Cl. 37-117.500.

ASEA Aktiebolag: *See—*
Adlerborn, Jan, 4,081,272, Cl. 75-223.000.
Palmer, Peter, 4,081,741, Cl. 323-43.50R.

Ashby, Eugene C., to Ethyl Corporation. Manufacture of complex hydrides. 4,081,524, Cl. 423-644.000.

Ashcroft, Ian Reginald: *See—*
English, Paul Everitt; Ashcroft, Ian Reginald; and Bosher, David Robert, 4,081,291, Cl. 136-232.000.

Ashton, Thomas A.: *See—*
Washburn, Joseph W.; and Ashton, Thomas A., 4,081,630, Cl. 179-189.00R.

Associated Portland Cement Manufacturers Limited, The: *See—*
Pennell, Anthony Robin, 4,081,285, Cl. 106-100.000.

Association pour la Rationalisation et la Mecanisation de l'Exploitation Forestiere (A.R.ME.F.): *See—*
Loigerot, Jean, 4,081,007, Cl. 144-3.00D.

Atari, Inc.: *See—*
Brown, Robert J., 4,081,829, Cl. 358-82.000.

Ateliers des Charmilles, S.A.: *See—*
Janicke, Johann; and Marendaz, Georges-Andre, 4,081,652, Cl. 219-69.00W.

Athena Controls Inc.: *See—*
Evalds, Egils; and Coccio, Ernest F., 4,081,691, Cl. 307-41.000.

Atkin, Curtis Lyman; and Stephen, Robert Longfield, to University of Utah. Leakage indicator for recirculating peritoneal dialysis system. 4,081,372, Cl. 210-94.000.

Atlantic Richfield Company: *See—*
Baillie, Lloyd A., 4,081,249, Cl. 23-288.00S.

Atlas Copco Aktiebolag: *See—*
Andersson, Sture R.; Blomberg, Jarl J.; and Elmessaar, Heino, 4,081,038, Cl. 173-162.000.

Atomic Products Corporation: *See—*
Reiss, Meyer M., 4,081,689, Cl. 250-515.000.

Atron, Inc.: *See—*
Savard, Hassel J., Jr., 4,080,928, Cl. 118-59.000.

Atterbury, Robert Edwin, to Foseco Trading, A.G. Hot top lining slabs and sleeves. 4,081,168, Cl. 249-106.000.

Aubert, Gilles; and Petit, Guy, to Commissariat a l'Energie Atomique. Device for thermal insulation of a prestressed concrete vessel which affords resistance to the pressure of a vaporizable fluid contained in said vessel. 4,081,322, Cl. 176-37.000.

Aubert, Roger; and Baujat, Jacques, to Commissariat a l'Energie Atomique. Internal structure for a nuclear reactor vessel. 4,081,325, Cl. 176-87.000.

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Crist, Scott D., 4,081,627, Cl. 179-115.5PV.

Augenstein, Bruno W.; and Dougherty, Charles B., to Rand Corporation, The. Projectile. 4,080,900, Cl. 102-67.000.

Aultz, Daniel Eugene: *See*—
McFadden, Arthur Raymond; and Aultz, Daniel Eugene, 4,081,457, Cl. 260-332.20C.

Automobiles Peugeot: *See*—
Bertrand, Bernard, 4,080,941, Cl. 123-119.00A.

AUVE Patentverwertungsgesellschaft mit beschrankter Haftung: *See*—
Ryba, Anton, 4,081,066, Cl. 192-82.00T.

Avrus, Albert Vladimirovich: *See*—
Glikman, Mark Leonovich; Tjurin, Jury Mikhailovich; Gorshkov, Gennady Nikolaevich; Gorokhovsky, Vladilen Alexandrovich; Shabanov, Alexei Georgievich; Sapunar, Zakhar Isaevich; Avrus, Albert Vladimirovich; and Fainberg, Evgeny Borisovich, 4,081,260, Cl. 65-25.00A.

Ax, Wolfgang: *See*—
Porzsolt, Franz; Tautz, Christoph; Schmidtberger, Rudolf; Ax, Wolfgang; and Enders, Burkhard, 4,081,241, Cl. 23-230.00B.

Ayerst, McKenna & Harrison Limited: *See*—
Immer, Hans U.; Nelson, Verner R.; and Sestanj, Kazimir, 4,081,530, Cl. 424-177.000.

Azoulay, Edgard Elie Yves, to Adour Entreprise. Protein enrichment of maize, cassava and other starchy products by direct fermentation. 4,081,557, Cl. 426-18.000.

B. F. Goodrich Company, The: *See*—
Anderson, Ralph Francis, 4,081,348, Cl. 204-242.000.
Cohen, Louis, 4,081,248, Cl. 23-285.000.
Hein, Richard William, 4,081,332, Cl. 203-51.000.

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Pierce, Paul, Jr., 4,080,886, Cl. 100-4.000.

Baab, Albert; and Himmelsbach, Paul, to Jos. Schneider & Co., Optische Werke Kreuznach. Diaphragm preselector for camera objective. 4,081,811, Cl. 354-272.000.

Babcock-Hitachi Kabushiki Kaisha: *See*—
Hishinuma, Yukio; Akimoto, Hidetoshi; Kaji, Ryuichi; Nakajima, Fumito; and Arikawa, Yoshijiro, 4,081,509, Cl. 423-235.000.

Babinsky, Andrew D.: *See*—
Hora, Charles J.; and Babinsky, Andrew D., 4,081,349, Cl. 204-252.000.

Bachmann, Klaus Jurgen; Buehler, Ernest; Shay, Joseph Leo; and Wagner, Sigurd, to Bell Telephone Laboratories, Incorporated. Solar cells and photovoltaic devices of InP/CdS. 4,081,290, Cl. 136-89.0TF.

Badono, Shinzi: *See*—
Oda, Minoru; and Badono, Shinzi, 4,081,696, Cl. 307-229.000.

Bagnall, Arthur Francis: *See*—
Freeman, James Edward; Bagnall, Arthur Francis; and McKenzie, Marion, legal representative, 4,080,779, Cl. 57-160.000.

Bailey, Ronald G. Method for repairing wheel hubs for vehicles. 4,080,705, Cl. 29-159.300.

Baillie, Lloyd A., to Atlantic Richfield Company. Chemical conversion apparatus and method. 4,081,249, Cl. 23-288.00S.

Baird, David Boyd; Fischwick, Brian Ribbons; Campbell, James Stanley; and Smith, Peter, to Imperial Chemical Industries Limited. Disperse azo dyestuffs derived from a 3-amino-7-azabenz-2,1-isothiazole diazo component. 4,081,435, Cl. 260-156.000.

Baker, Don R.; and Teach, Eugene G., to Stauffer Chemical Company. Sulfonyloxy bromoacetanilides and their utility as biocides. 4,081,474, Cl. 260-456.00A.

Baker, Don Robert; Walker, Francis Harry; and Tseng, Chien Knei, to Stauffer Chemical Company. Thiolcarbamate sulfoxides stabilized with acetylenic compounds. 4,081,468, Cl. 260-551.00R.

Baker, Maurice W.; Kerry, John C.; Kozlik, Antonin; Marshall, John R.; Nichol, Kenneth J.; and Weighton, David M., to Boots Company Limited, The. 1-Morpholinocarbonyl imidazoles. 4,081,540, Cl. 424-248.510.

Baker, Max: *See*—
Gray, Thomas J.; Wojtowicz, Jan; and Baker, Max, 4,081,005, Cl. 141-32.000.

Baker Perkins Chemical Machinery Limited: *See*—
Hucklesby, John Charles; Lilley, Raymond Arthur; and Jackson, Ronald Henry, 4,081,862, Cl. 366-99.000.

Baker, Stephen Richard; and Holdrege, Charles Truman, to Bristol-Myers Company. Antibacterial agents. 4,081,441, Cl. 260-239.100.

Baldwin, Ernest, to Tinsley Wire Industries Limited. Concrete reinforcement. 4,081,159, Cl. 245-2.000.

Balsley, Richard Benjamin, to American Cyanamid Company. Process for dry quaternization of azo compounds. 4,081,436, Cl. 260-156.000.

Balyoz, John; Gruodis, Algirdas Joseph; Jen, Teh-Sen; and Mikhail, Wadie Faltas, to International Business Machines Corporation. High density semiconductor circuit layout. 4,080,720, Cl. 29-577.00C.

Banes, Charles W., to Raymond Lee Organization, Inc., The, a part interest. Dual toilet flushing system. 4,080,668, Cl. 4-325.000.

Bar-on, Ari; and Hattler, Louis R., to Xerox Corporation. Fuser drive system. 4,081,213, Cl. 355-3.0FU.

Baranov, Alexandr Nikolaevich: *See*—
Repolovsky, Alexandr Ivanovich; Pakhter, Ilya Kharitonovich; Rudakov, Alexei Dmitrievich; Baranov, Alexandr Nikolaevich; Gliner, Leonid Efimovich; Gapoian, Dmitry Trdatovich; and Tumasiants, Igor Veniaminovich, 4,080,875, Cl. 92-29.000.

Barber-Colman Company: *See*—
Anderson, George H.; and Barrett, William J., 4,081,733, Cl. 318-610.000.
Barrett, William J.; and Meyer, Hal G., 4,081,774, Cl. 335-228.000.

Barbour, Deryle R. Method and apparatus for removing a vehicle windshield. 4,080,734, Cl. 30-123.000.

Barger, John Joseph; Blevins, Milton Lee; and Savor, Dennis Edward, to Combustion Engineering, Inc. Automatic seal welding apparatus. 4,081,650, Cl. 219-60.00A.

Barnard, Edward G., to Peter Stuyvesant of Canada, Limited. Dual-bundle cigarette packaging structure. 4,081,126, Cl. 229-44.0CB.

Barrett, Harrison H.: *See*—
Swindell, William; and Barrett, Harrison H., 4,081,673, Cl. 250-237.00R.

Barrett, William J.; and Meyer, Hal G., to Barber-Colman Company. Actuating device. 4,081,774, Cl. 335-228.000.

Barrett, William J.: *See*—
Anderson, George H.; and Barrett, William J., 4,081,733, Cl. 318-610.000.

Bartley, Louise M. Soap bar. 4,081,394, Cl. 252-91.000.

Bartz, Gerald L., to Phillips Petroleum Company. Geophysical and geochemical exploration. 4,081,675, Cl. 250-255.000.

Barua, Girish Chandra; and Burkhard, Herbert, to American Cyanamid Company. Emulsifiers useful for emulsion polymerization of vinyl monomers. 4,081,418, Cl. 260-29.6MQ.

BASF Aktiengesellschaft: *See*—
Baumann, Manfred; and Hoffmann, Werner, 4,081,482, Cl. 260-586.00C.
Hoffmann, Werner; Himmele, Walter; Paust, Joachim; Von Fraunberg, Karl; Siegel, Hardo; and Pfohl, Sigberg, 4,081,477, Cl. 260-563.00P.

Bassani Ticino S.p.A.: *See*—
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Bassin, Morton; and Tseng, Eugene, to Maryland Environmental Service. Method for forming coated cellular glass pellets. 4,081,259, Cl. 65-21.000.

Bastian, Jean-Michel, to Sandoz Ltd. 5-Substituted-1,2,3,4-tetrahydrobenzo[g]isoquinolines. 4,081,543, Cl. 424-258.000.

Bastide, Maurice. Process and a device for the extrusion of materials in the form of narrow wires. 4,080,817, Cl. 72-253.00R.

Bateman, Earle W., III. Archery bow string silencer. 4,080,951, Cl. 124-92.000.

Bateman, John H., to Ciba-Geigy Corporation. Method of making 1,1,3-tri-substituted-3-phenylindane from α-substituted styrene compounds. 4,081,489, Cl. 260-668.00F.

Batterton, Thomas E. Method of cleaning. 4,081,396, Cl. 252-106.000.

Batz, James E., to Northern Illinois Gas Company. Frequency/space diversity data transmission system. 4,081,748, Cl. 325-56.000.

Baudouin, Jacques; and Caspar, Jean-Pierre, to Lafarge S.A. Process for obtaining mineral charges and their application. 4,081,286, Cl. 106-306.000.

Baudouin, Jacques; and Caspar, Jean-Pierre, to Lafarge S.A. Manufacturing process of mineral charges, products obtained and their application. 4,081,287, Cl. 106-306.000.

Bauer, Dan O.; and Salemka, Robert M., to Pneumo Corporation. Servoactuator. 4,080,873, Cl. 91-446.000.

Bauer, Ronald S., to Shell Oil Company. Saturated epoxy resin coating compositions exhibiting improved weatherability. 4,081,491, Cl. 260-834.000.

Bauer, Rudolf; Goppelt, Dieter; Kruger, Hans-Christian; and Pfitscher, Max, to Industriewerk Schaeffler OHG. Ball bearings and ball races. 4,081,204, Cl. 308-216.000.

Baughman, Don L.: *See*—
Scherrer, Charles L.; and Baughman, Don L., 4,081,082, Cl. 213-62.00A.

Baujat, Jacques: *See*—
Aubert, Roger; and Baujat, Jacques, 4,081,325, Cl. 176-87.000.

Baumann, Manfred; and Hoffmann, Werner, to BASF Aktiengesellschaft. Manufacture of 2,6,6-trimethyl-cyclohex-2-en-1-one. 4,081,482, Cl. 260-586.00C.

Baxter Travenol Laboratories, Inc.: *See*—
Phillips, Thomas E., 4,080,965, Cl. 128-214.00D.
Uffer, Michael B.; and Wang, Clarence, 4,081,660, Cl. 219-504.000.

Bayer Aktiengesellschaft: *See*—
Freitag, Dieter; Nouvertne, Werner; and Kleiner, Frank, 4,081,495, Cl. 260-860.000.
Fuchs, Rainer Alois; Hammann, Ingeborg; Behrenz, Wolfgang; and Homeyer, Bernhard, 4,081,535, Cl. 424-200.000.
Konig, Hans-Bodo; Metzger, Karl Georg; and Schrock, Wilfried, 4,081,539, Cl. 424-246.000.
Moller, Eike; Meng, Karl; Wehinger, Egbert; and Horstmann, Harald, 4,081,596, Cl. 548-367.000.
Traenckner, Hans-Joachim; Fuhr, Karl; Rosenkranz, Hans Jurgen; Patheiger, Manfred, deceased; and Rudolph, Hans, 4,081,492, Cl. 260-837.00R.

BBC Brown Boveri & Company Limited: *See*—
Cornu, Jozef; and Sittig, Roland, 4,081,821, Cl. 357-38.000.
Nagel, Hartmut; and Perkins, Roger, 4,081,297, Cl. 148-103.000.
Oberle, Arthur, 4,080,790, Cl. 60-661.000.

Beauchemin, George A., Jr. Measurement of fuel quality and economy. 4,080,834, Cl. 73-443.000.

Beck, Donald: *See*—
Mick, Peter; and Beck, Donald, 4,081,830, Cl. 358-105.000.

Beck, Edward G., Jr., to Stolle Corporation, The. Radiating or absorbing heat exchange panel. 4,080,703, Cl. 29-157.30C.

Becker, Otto Alfred. Apparatus for electroplating metal surfaces, in

particular cut edges formed by stacking sheet metal panels cut to size. 4,081,347, Cl. 204-224.00R.

Beckman Instruments, Inc.: *See—*
Knight, William S.; and Kelley, Barbara J., 4,081,525, Cl. 424-1.000.
Neti, Radhakrishna Murty; and Cederstrand, Carl Nelson, 4,081,247, Cl. 23-232.00E.
Polito, Alan J.; and Knight, William S., 4,081,244, Cl. 23-230.600.
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Beecham Group Limited: *See—*
Clayton, John Peter, 4,081,545, Cl. 424-271.000.
Ferres, Harry, 4,081,546, Cl. 424-271.000.

Beene, Gerald Wayne; and Martin, Hubert C., Jr., to Reliance Telecommunication Electronics Company. Synchronous ring detector for station carrier telephone systems. 4,081,609, Cl. 179-2.50R.

BEGA A.G.: *See—*
Scharer, Samuel, 4,081,052, Cl. 180-82.00C.

Behr, Hans. Nozzle construction. 4,081,138, Cl. 239-222.170.

Behrenz, Wolfgang: *See—*
Fuchs, Rainer Alois; Hammann, Ingeborg; Behrenz, Wolfgang; and Homeyer, Bernhard, 4,081,535, Cl. 424-200.000.

Behringwerke Aktiengesellschaft: *See—*
Porzsolt, Franz; Tautz, Christoph; Schmidtberger, Rudolf; Ax, Wolfgang; and Enders, Burkhard, 4,081,241, Cl. 23-230.00B.

Bell, Peter William: *See—*
Queen, David Stewart; Bell, Peter William; Dick, Thomas Hutcheson; and Edgar, John Black, 4,081,579, Cl. 428-95.000.

Bell Telephone Laboratories, Incorporated: *See—*
Albanese, Andres, 4,081,670, Cl. 250-199.000.
Ammann, Hans Hugo, 4,081,658, Cl. 219-233.000.
Bachmann, Klaus Jurgen; Buehler, Ernest; Shay, Joseph Leo; and Wagner, Sigurd, 4,081,290, Cl. 136-89.0TF.
Benesh, James Owen; and Still, Donald Eric, 4,081,629, Cl. 179-178.000.
Goodman, David Joel; Johnston, James David; and Noll, A. Michael, 4,081,620, Cl. 179-81.00A.
Keramidas, Vassilis George, 4,081,824, Cl. 357-67.000.
Seidel, Harold, 4,081,692, Cl. 307-64.000.

Bellis, John Louis, to USM Corporation. Automatic splice relief control. 4,080,888, Cl. 100-47.000.

Beloit Corporation: *See—*
Dreher, George L., 4,080,890, Cl. 100-170.000.

Benedek, Sandor: *See—*
Csom, Gyula; Desi, Sandor; Szolnay, Eva; Gyurkocza, Csaba; Szucs, Imre; Varbiro, Vilmos; Elo, Sandor; and Benedek, Sandor, 4,081,683, Cl. 250-364.000.

Benesh, James Owen; and Still, Donald Eric, to Bell Telephone Laboratories, Incorporated. Snap-in bracket for mounting a telephone dial within a telephone housing. 4,081,629, Cl. 179-178.000.

Benguerel, Francois; and Salzmann, Jean-Jacques, to Sandoz Ltd. Anionic azo dyes having a 3-dibenzofuranyl diazo component radical optionally having A2-or 8-sulfo group. 4,081,438, Cl. 260-160.000.

Benischeck, Joseph J.: *See—*
Warburton, Charles E., Jr.; and Benischeck, Joseph J., 4,081,383, Cl. 252-8.600.

Benjamin, Milton Lloyd; Walker, David Dean; and Miles, Wilbur Nelson, to Erickson Tool Company. Precision heavy duty indexer. 4,080,849, Cl. 74-813.00R.

Bennett, Christopher John. Solar panel. 4,080,957, Cl. 126-271.000.

Benson, Sidney W. Method of deuterium isotope separation and enrichment. 4,081,339, Cl. 204-158.00R.

Benzing, Walter C.: *See—*
McNeilly, Michael A.; Benzing, Walter C.; and Locke, Richard M., Jr., 4,081,313, Cl. 156-610.000.

Berenschot, Donald J.; Anders, Dale F.; and Hawker, Fred D., to DeSoto, Inc. High gloss latex coatings containing mercaptan-terminated emulsion copolymer and dissolved carboxyl-functional resin salt. 4,081,416, Cl. 260-29.4UA.

Berg, Anthony D., to Coherent, Inc. Etalon laser mode selector. 4,081,760, Cl. 331-94.50C.

Berg, Anthony D.; and Wise, William L., to Coherent, Inc. Method and apparatus for providing a calibrated scan for a scanning laser. 4,081,765, Cl. 331-94.50C.

Bergdahl, Sven Gunnar: *See—*
Aberg, Sven Ulrik Torbjorn; and Bergdahl, Sven Gunnar, 4,081,316, Cl. 162-4.000.

Berger, Roland, to Siemens Aktiengesellschaft. Arrangement for the preparation of a body cross-section image. 4,081,685, Cl. 250-416.0TV.

Berkeley, Joseph. Posture-training brace. 4,080,962, Cl. 128-78.000.

Bernard, Robert E.: *See—*
Goffe, Charles A., deceased; Heseltine, Donald W.; and Bernard, Robert E., 4,081,279, Cl. 96-48.0HD.

Bernstein, Lawrence Allen: *See—*
Moe, Walter; Diker, Charles Michael; and Bernstein, Lawrence Allen, 4,081,145, Cl. 241-93.000.

Bertelli, Aldo, to Rorer Italiana S.p.A. Steroid derivatives. 4,081,541, Cl. 424-243.000.

Berthelot, Jean-Paul; and Marin, Pierre Dominique, to Exxon Research & Engineering Co. Electrical insulating oils containing trialkyl benzenes. 4,081,393, Cl. 252-63.000.

Berthet, Jean-Pierre; Cailloux, Jean-Guy; and Clement, Philippe, to Etat Francais represente par le Delegue Ministeriel pour l'Armement. Towing apparatus. 4,080,920, Cl. 114-244.000.

Bertrand, Bernard, to Automobiles Peugeot. Device for recycling the exhaust gases of an internal combustion engine. 4,080,941, Cl. 123-119.00A.

Beyl, Jean Joseph Alfred. Safety ski binding. 4,081,186, Cl. 280-618.000.

BFG Glassgroup: *See—*
Mestre, Pierre; and Payen, Jose, 4,081,263, Cl. 65-106.000.

Bhat, Vasanth K.; Siegel, Allen E.; Vogel, Richard E.; and Burrows, Larry G., to Emerson Electric Co. Glow plug with idle bar. 4,080,944, Cl. 123-145.00A.

Bianco, Eric L. Shutter assembly for slot or aperture. 4,080,908, Cl. 109-66.000.

Bickel, Gary W.: *See—*
Goell, James E.; Bickel, Gary W.; Kao, Charles K.; and Maklad, Mokhtar S., 4,081,258, Cl. 65-2.000.

Biggerstaff, William L. Two-level toilet flush system. 4,080,669, Cl. 4-325.000.

Biggs, Howard, Jr.; and Meiley, Vincent Raymond. High velocity spiral air motor. 4,080,787, Cl. 60-407.000.

Bills, Reed G., to Reynolds Metals Company. Semi-continuous direct chill casting apparatus. 4,081,021, Cl. 164-154.000.

Bio-Kinetics Inc.: *See—*
Hulls, John Robin; and Donofrio, David Michael, 4,081,367, Cl. 210-11.000.

Bio-Systems Research, Inc.: *See—*
Vogeley, Arthur W., 4,081,623, Cl. 179-90.0BD.

Biornstad, Peter, to Sulzer Brothers Limited. Flow straightener for a liquid flow. 4,080,997, Cl. 138-37.000.

Biotest-Serum-Institut GmbH: *See—*
Stephan, Wolfgang; and Kotitschke, Ronald, 4,081,431, Cl. 260-112.00B.

Birum, Gail H.; and Jansen, Richard F., to Monsanto Company. Production of 2-carboxyethyl(phenyl)phosphinic acid. 4,081,463, Cl. 260-502.40R.

Black Clawson Company, The: *See—*
Seifert, Peter; Chupka, David E.; Getz, Lynn L.; Hatton, Derald R.; Thomas, R. Marvin; Osso, John M.; and Rogl, Herbert A., 4,081,147, Cl. 241-261.300.

Black, James A.: *See—*
Wedell, David A., 4,080,893, Cl. 101-124.000.

Black, Sheppard A.: *See—*
Shichman, Daniel; Percarpio, Peter E.; and Black, Sheppard A., 4,081,310, Cl. 156-398.000.

Blaire, Pete. Meat cleaning machine. 4,080,682, Cl. 15-3.100.

Blakely, Jerald Wayne: *See—*
Alter, Hobart Laidlaw; and Blakely, Jerald Wayne, 4,080,917, Cl. 114-106.000.

Blakesley Pulley Corporation: *See—*
Blakesley, Roland F., 4,080,704, Cl. 29-159.00R.

Blakesley, Roland F., to Blakesley Pulley Corporation. Circular form process for pulleys. 4,080,704, Cl. 29-159.00R.

Blanc, Jean-Pierre: *See—*
Lietar, Christian; and Blanc, Jean-Pierre, 4,081,210, Cl. 350-223.000.

Blanding, Douglass Lane, to Eastman Kodak Company. Head carrier providing independent protrusion adjustment. 4,081,848, Cl. 360-109.000.

Blevins, Milton Lee: *See—*
Barger, John Joseph; Blevins, Milton Lee; and Savor, Dennis Edward, 4,081,650, Cl. 219-60.00A.

Blick, Milton: *See—*
Snyder, Carl J.; and Blick, Milton, 4,081,746, Cl. 324-116.000.

Block, Charles S.; Chen, Michael S.; Noichl, Olaf J.; and Hong, Sunnan, to Air Products & Chemicals, Inc. Activated sludge system with staggered partition basin. 4,081,368, Cl. 210-14.000.

Blodee, Leif. Chair grouping. 4,081,199, Cl. 297-232.000.

Blomberg, Jarl J.: *See—*
Andersson, Sture R.; Blomberg, Jarl J.; and Elmessaar, Heino, 4,081,038, Cl. 173-162.000.

Blonder-Tongue Laboratories, Inc.: *See—*
Sperber, Martin; Eggerts, Ragnars Martin; and Scherer, George, 4,081,839, Cl. 358-186.000.

Blumel, Harald; and Lipp, Paul, to Chemische Werke Huls Aktiengesellschaft. Process for the production of homogeneous, bar-shaped or granular thermoplastic compositions. 4,081,502, Cl. 264-140.000.

Bochumer Eisenhutte Heintzmann GmbH & Co.: *See—*
Neu, Gustav, 4,080,794, Cl. 61-45.00D.

Bode, Wolfgang W.; and Fein, Michael E., to Owens-Illinois, Inc. Addition of helium to gaseous medium of gas discharge device. 4,081,712, Cl. 313-226.000.

Bodenseewerk Perkin-Elmer & Co., GmbH: *See—*
Huber, Bernard, 4,080,833, Cl. 73-423.00A.

Boehringer Mannheim GmbH: *See—*
Jaworek, Dieter; Botsch, Karl-Heinz; Weimann, Gunter; Nelbock-Hochstetter, Michael; and Determann, Helmut, 4,081,329, Cl. 195-63.000.

Boeing Company, The: *See—*
Foster, Gene B., 4,080,815, Cl. 72-168.000.
MacSpadden, Floyd E.; Schellhase, Frank A.; Strong, Robert L.; and Tieden, Jansey D., 4,081,734, Cl. 318-645.000.

Bohme, Dietrich; Schumann, Gunter Hellmut; Hahn, Gunter; and Jung, Rolf, to Messer Griesheim GmbH. Photoelectric line follower. 4,081,671, Cl. 250-202.000.

Bohmer, Walter; and Falticko, Stefan. Slip form. 4,081,227, Cl. 425-65.000.

Bolgiano, Duane Ridgely, to International Mobile Machines Corporation. Filter-type pulse detection means. 4,081,130, Cl. 235-92.0PB.

Bompard, Bruno; Brochier, Jean; and Bruyere, Alain, to Commissariat

a l'Energie Atomique. Method of and apparatus for the production of bodies or parts of three-dimensional fabric. 4,080,915, Cl. 112-412.000.

Bonhard, Robert Bruce. Rudder control device. 4,080,918, Cl. 114-172.000.

Booe, James M., to P. R. Mallory & Co. Inc. Desiccant for electrical and electronic devices. 4,081,397, Cl. 252-194.000.

Boone, David E.: *See*—
Peters, Edwin F.; and Boone, David E., 4,081,589, Cl. 526-97.000.

Boots Company Limited, The: *See*—
Baker, Maurice W.; Kerry, John C.; Kozlik, Antonin; Marshall, John R.; Nichol, Kenneth J.; and Weighton, David M., 4,081,540, Cl. 424-248.510.

Bordovsky, Jaromir: *See*—
Katz, Klaus; and Bordovsky, Jaromir, 4,080,871, Cl. 91-417.00R.

Borg-Warner Corporation: *See*—
Donaldson, Desmond M., 4,081,025, Cl. 165-140.000.
Smirl, Richard L., 4,080,848, Cl. 74-759.000.
Smith, Grant H.; and Hayter, John C., 4,081,064, Cl. 192-70.130.
Underwood, Herbert N., 4,080,843, Cl. 74-336.00R.

Borghi, Sergio. Annular structures for the erection of buildings. 4,080,769, Cl. 52-582.000.

Borginon, Hendrik Alfons: *See*—
Vanassche, Willy Joseph; Pattyn, Herman Alberik; and Borginon, Hendrik Alfons, 4,081,281, Cl. 96-64.000.

Borodin, Valerian Alexeevich; Onikov, Eduard Arshakovich; Sakharov, Boris Alexandrovich; Zabotin, Alexandr Alexandrovich; Loschilin, Evgeny Dmitrievich; and Galperin, Alexandr Lvovich. Apparatus for propelling the weft thread carriers in travelling-wave looms. 4,081,001, Cl. 139-436.000.

Borstad, Jay: *See*—
Morrow, James G., Sr.; Pech, David J.; and Borstad, Jay, 4,081,081, Cl. 212-49.000.

Borsuk, Alvin, to Oscar Mayer & Co. Inc. Method and apparatus for continuously making loaf meat. 4,081,564, Cl. 426-513.000.

Bortels, Raoul Jan: *See*—
Corluy, Hans Josephus; Schelfaut, Francois Leon; Nys, Pierre Herman; and Bortels, Raoul Jan, 4,081,280, Cl. 96-50.00A.

Bosch, Paul: *See*—
Fricke, Hans-Jurgen; and Bosch, Paul, 4,081,223, Cl. 417-218.000.

Bosher, David Robert: *See*—
English, Paul Everitt; Ashcroft, Ian Reginald; and Bosher, David Robert, 4,081,291, Cl. 136-232.000.

Bosso, Joseph F.: *See*—
Christenson, Roger M.; Bosso, Joseph F.; Hartman, Marvis E.; and Chang, Wen-Hsuan, 4,081,341, Cl. 204-181.00C.

Botsch, Karl-Heinz: *See*—
Jaworek, Dieter; Botsch, Karl-Heinz; Weimann, Gunter; Nelbock-Hochstetter, Michael; and Determann, Helmut, 4,081,329, Cl. 195-63.000.

Bottcher, Werner: *See*—
Ender, Gunter; Schultz, Helmut; Thiele, Hartmut; Gruber, Leo; Kober, Heinrich; Bottcher, Werner; and Macheiner, Tibor, 4,081,151, Cl. 242-68.500.

Bouillet, Andre, to Moulinex, Societe Anonyme. Electrical household appliance such as a mincer or grinder. 4,081,144, Cl. 241-37.500.

Bourns, Inc.: *See*—
Hildreth, Bradrick Alan; Stephens, Donald Harrison; and Wiley, George Richard, 4,081,782, Cl. 338-200.000.
Rhind, Terence Keith; Andrews, Allen Howe; Burdine, Warren Emil; and Hendrie, John Matthew, 4,081,780, Cl. 338-164.000.

Boutin, Jean Rene: *See*—
Crowell, John Arnold; and Boutin, Jean Rene, 4,081,006, Cl. 141-330.000.

Bovo, Amilcare; Gubertini, Giampaolo; Musumeci, Luigi; and Valbonesi, Giuseppe, to Societa Italiana Telecomunicazioni SIEMENS S.p.A. Coupling network for time-division telecommunication system. 4,081,611, Cl. 179-15.0AT.

Bowen Tools, Inc.: *See*—
Burns, Albert L., 4,080,761, Cl. 51-438.000.

Bowen, Victor Ross, to J. I. Case Company. Tractor with ripper attachment having a combined tool bar and counterweight container. 4,081,035, Cl. 172-484.000.

Bozeman, James Dee: *See*—
Reusswig, Gerhard Helmut; Bozeman, James Dee; and Ray, Don Reagan, 4,080,798, Cl. 61-103.000.

Bracco, Umberto, to Societe d'Assistance Technique pour Produits Nestle S.A. Milk chocolate manufacturing. 4,081,568, Cl. 426-584.000.

Brad Ragan, Inc.: *See*—
Clayton, Andrew Robert, 4,081,016, Cl. 157-13.000.

Braitberg, Michael F., to Honeywell Inc. Magnetic recording with bias and data mixing circuit. 4,081,845, Cl. 360-68.000.

Brandon, Bobby C.: *See*—
DePriest, Donald R.; Brandon, Bobby C.; and Buie, Connell M., 4,081,306, Cl. 156-250.000.

Brault, Albert Thomas; Light, William Andrew; and Martin, Thomas William, to Eastman Kodak Company. Method for making a solid-state color imaging device having an integral color filter and the device. 4,081,277, Cl. 96-38.200.

Braumann, Gundokar: *See*—
Rockl, Friedrich; Stocker, Helmut; and Braumann, Gundokar, 4,081,775, Cl. 335-271.000.

Braun Aktiengesellschaft: *See*—
Gahler, Egon, 4,081,739, Cl. 320-32.000.

Bray, William Edward, to Texas Instruments Incorporated. Motion control system for an inductively controlled multi-phase motor. 4,081,735, Cl. 318-696.000.

Brazier, Ernest Reginald: *See*—
Holmes, William Samuel; Lowe, Edward James; and Brazier, Ernest Reginald, 4,081,333, Cl. 203-86.000.

Bregman, David; Hanson, Bruce L.; and Wolvek, Sidney, to Datascope Corporation. Apparatus for aiding and improving the blood flow in patients. 4,080,958, Cl. 128-1.00D.

Briggs, Eugene C.; Wellbaum, William C.; and Shaftner, Robert F., to Koehring Company. Portable heater. 4,081,238, Cl. 432-222.000.

Brimer, Claude Morris; and Von Brimer, Joe W., deceased (by Brimer, Claude Morris, executor), to Linear International Corporation. Electric motor. 4,081,726, Cl. 318-207.00A.

Brimer, Claude Morris, executor: *See*—
Brimer, Claude Morris; and Von Brimer, Joe W., deceased, 4,081,726, Cl. 318-207.00A.

Brinkley, Max D.: *See*—
Appleby, Paul E.; Brinkley, Max D.; and Smith, Clement C., 4,081,017, Cl. 157-13.000.

Brinkman, Willem, to Holec N.V. Combustion engine and injector for a combustion engine. 4,080,949, Cl. 123-32.0ST.

Bristol-Myers Company: *See*—
Baker, Stephen Richard; and Holdrege, Charles Truman, 4,081,441, Cl. 260-239.100.

British Steel Corporation: *See*—
English, Paul Everitt; Ashcroft, Ian Reginald; and Bosher, David Robert, 4,081,291, Cl. 136-232.000.

Brittain, Darryl A.: *See*—
Anderson, Paul L.; and Brittain, Darryl A., 4,081,476, Cl. 560-255.000.

Brochier, Jean: *See*—
Bompard, Bruno; Brochier, Jean; and Bruyere, Alain, 4,080,915, Cl. 112-412.000.

Brodbeck, Hans: *See*—
Rosenmund, Peter; and Brodbeck, Hans, 4,081,381, Cl. 210-408.000.

Brooks, Shirley R. Amusement apparatus. 4,081,184, Cl. 274-1.00R.

Brown-Bridge Mills Inc., The: *See*—
Gallagher, Nicholas D.; and Gibbs, Richard L., 4,080,878, Cl. 93-58.0ST.

Brown, James W., to General Packaging Corporation. Shipping bulkhead. 4,080,906, Cl. 105-489.000.

Brown, Lloyd C., to General Atomic Company. Fluidized bed-gas coater apparatus. 4,080,927, Cl. 118-48.000.

Brown Oil Tools, Inc.: *See*—
Wardlaw, Harold W. R., 4,081,039, Cl. 175-7.000.

Brown, Paul R.: *See*—
De George, Robert P.; and Brown, Paul R., 4,080,855, Cl. 83-71.000.

Brown, Robert J., to Atari, Inc. Audio activated video display. 4,081,829, Cl. 358-82.000.

Brown & Root, Inc.: *See*—
Weidler, Jay B., Jr., 4,080,795, Cl. 61-88.000.

Brown, Yull. Arc-assisted oxy/hydrogen welding. 4,081,656, Cl. 219-137.310.

Brubaker, Curtis M. Flyable hydrofoil vessel. 4,080,922, Cl. 114-282.000.

Bruns, Herbert F., to Bruns Technology, Inc. Air diffuser for ceiling air outlet. 4,080,882, Cl. 98-40.00D.

Bruns Technology, Inc.: *See*—
Bruns, Herbert F., 4,080,882, Cl. 98-40.00D.

Brunswick Corporation: *See*—
Muller, William C., 4,080,700, Cl. 29-157.00C.

Bruseschi, Duilio. Metallizing process and apparatus for applying metal sheet onto variously shaped ledges or frames. 4,081,304, Cl. 156-212.000.

Bruyere, Alain: *See*—
Bompard, Bruno; Brochier, Jean; and Bruyere, Alain, 4,080,915, Cl. 112-412.000.

Bubula, Thomas J.; Franz, Maurice F.; Johnson, Gordon W.; and Rinaldo, James D., to Caterpillar Tractor Co. Controls for combined hydrostatic and multiple speed range transmission units with automatic speed control and braking functions. 4,080,850, Cl. 74-861.000.

Buchanan, Stephen D.: *See*—
Johnson, Albert O.; Holiman, William E.; and Buchanan, Stephen D., 4,081,143, Cl. 241-29.000.

Buchnea, Alexander, to Sentrol Systems Ltd. On-line system for monitoring sheet material additives. 4,081,676, Cl. 250-272.000.

Buckler, Sheldon A., to Polaroid Corporation. Method of making flat battery. 4,080,728, Cl. 29-623.400.

Buckshaw, Thomas M.: *See*—
Stearley, John W.; Rowley, Paul M.; and Buckshaw, Thomas M., 4,081,637, Cl. 200-83.0WM.

Budapesti Muszaki Egyetem: *See*—
Csom, Gyula; Desi, Sandor; Szolnay, Eva; Gyurkocza, Csaba; Szucs, Imre; Varbiro, Vilmos; Elo, Sandor; and Benedek, Sandor, 4,081,683, Cl. 250-364.000.

Budinger, Raymond E.: *See*—
Koff, Bernard L.; Budinger, Raymond E.; and Johnson, James E., 4,080,785, Cl. 60-226.00R.

Buehler, Ernest: *See*—
Bachmann, Klaus Jurgen; Buehler, Ernest; Shay, Joseph Leo; and Wagner, Sigurd, 4,081,290, Cl. 136-89.0TF.

Buell, Kenneth B., to Procter & Gamble Company, The. Method and apparatus for continuously attaching discrete, stretched elastic strands to predetermined isolated portions of disposable abosrbent products. 4,081,301, Cl. 156-164.000.

Buie, Connell M.: *See*—
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Bulger, Frederick J.; Hawkins, Royal R.; and Kuntz, Leland E., to Honeywell Inc. Slope control system. 4,081,033, Cl. 172-4.500.
Bull, Dale L., to Nartron Corporation. Turn signal assembly self-cancelling means and override means. 4,081,634, Cl. 200-61.270.
Bull, David W., to Nartron Corporation. Multi-function electrical switch assembly. 4,081,633, Cl. 200-67.0DA.
Bulland, Julian A. Camera flash bracket. 4,081,814, Cl. 354-293.000.
Bulters, Hein; Heidemann, Gerrit; and de Putter, Warner Jan, to Industriele Onderneming Wavin N.V. Fiber reinforced sandwich tube. 4,080,999, Cl. 138-125.000.
Bunnell, Edward Dennman, to AMP Incorporated. Telephone cable splicing apparatus. 4,080,717, Cl. 29-566.400.
Burdine, Warren Emil: *See*—
Rhind, Terence Keith; Andrews, Allen Howe; Burdine, Warren Emil; and Hendrie, John Matthew, 4,081,780, Cl. 338-164.000.
Burge, David A. Toy blocks with conduits and fluid seal means. 4,080,752, Cl. 46-25.000.
Burkhard, Herbert: *See*—
Barua, Girish Chandra; and Burkhard, Herbert, 4,081,418, Cl. 260-29.6MQ.
Burkhard, Wilfried W. Drive for a pair of metering pumps. 4,080,874, Cl. 92-13.700.
Burns, Albert L., to Bowen Tools, Inc. Control valve assembly. 4,080,761, Cl. 51-438.000.
Burroughs Wellcome Co.: *See*—
Elion, Gertrude B.; and Strelitz, Robert A., 4,081,534, Cl. 424-180.000.
Burrows, Larry G.: *See*—
Bhat, Vasanth K.; Siegel, Allen E.; Vogel, Richard E.; and Burrows, Larry G., 4,080,944, Cl. 123-145.00A.
Buss Systems, Inc.: *See*—
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Butterley Building Materials Limited: *See*—
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Butterworth, George A. M.; Elias, Robert T.; and Miller, Wayne D., to Johnson & Johnson. Fibrous material and method of making the same. 4,081,582, Cl. 428-284.000.
Buzga, Heinrich, to Maschinenfabrik Buckau R. Wolf Aktiengesellschaft. Apparatus for separating particulate solids from liquids. 4,081,382, Cl. 210-414.000.
B.V. Machinefabriek M. Brouwer & Co.: *See*—
van Daalen, Peter, 4,080,773, Cl. 53-142.000.
C.E.R.C.A., Compagnie pour l'Etude et la Realisation de Combustibles Atomiques: *See*—
Picard, Paul, 4,081,121, Cl. 228-181.000.
Cadbury Limited: *See*—
Jeffery, Maurice Stanley; Glynn, Paul Anthony; and Khan, Mohammed Moiz Uddin, 4,081,559, Cl. 426-103.000.
Cahn, Robert P.: *See*—
Li, Norman N. Edison; Cahn, Robert P.; and Shrier, Adam L., 4,081,369, Cl. 210-22.00R.
Nadler, Murray; and Cahn, Robert P., 4,080,791, Cl. 60-670.000.
Cailloux, Jean-Guy: *See*—
Berthet, Jean-Pierre; Cailloux, Jean-Guy; and Clement, Philippe, 4,080,920, Cl. 114-244.000.
Calhoun, Albert J., to Glentworth Manufacturing Inc. Machinery guard. 4,080,846, Cl. 74-615.000.
California Institute of Technology: *See*—
Hsu, George C.; Gavalas, George R.; Ganguli, Partha S.; and Kalfayan, Sarkis H., 4,081,250, Cl. 44-1.00R.
Koblasz, Arthur J.; Fender, Derek H.; Yasui, Syozo; and Dekker, Cornelis M., 4,081,858, Cl. 364-553.000.
Calleance, David P., to Calleance, Sandra L., a part interest. Water mattress construction. 4,080,676, Cl. 5-371.000.
Calleance, Sandra L.: *See*—
Calleance, David P., 4,080,676, Cl. 5-371.000.
Cambrian Engineering Group Limited, The: *See*—
Malcolm, David George, 4,081,500, Cl. 264-9.000.
Campbell, Henry Fred, to Campbell Research Corporation. Building construction. 4,080,881, Cl. 98-31.000.
Campbell, James Stanley: *See*—
Baird, David Boyd; Fischwick, Brian Ribbons; Campbell, James Stanley; and Smith, Peter, 4,081,435, Cl. 260-156.000.
Campbell Research Corporation: *See*—
Campbell, Henry Fred, 4,080,881, Cl. 98-31.000.
Campbell, William Patrick, III. Solar energy system. 4,081,289, Cl. 136-89.0PC.
Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence: *See*—
Gray, Thomas J.; Wojtowicz, Jan; and Baker, Max, 4,081,005, Cl. 141-32.000.
Canada Wire and Cable Limited: *See*—
Paniri, Zvi; and Rudd, Thomas H., 4,081,602, Cl. 174-103.000.
Canadian General Electric Company, Ltd.: *See*—
Sack, Stanley F.; and Mattuck, Morris, 4,081,778, Cl. 337-186.000.
Canas, Raoul: *See*—
Kanowsky, Vincent C.; and Canas, Raoul, 4,080,675, Cl. 5-345.00R.
Candor, James T. Electrostatic method for treating material. 4,081,342, Cl. 204-180.00R.
Canon Kabushiki Kaisha: *See*—
Kanaiwa, Kiyoshi, 4,081,604, Cl. 178-30.000.
Kawamura, Masaharu; Sakurada, Nobuaki; Ito, Tadashi; Murakami, Hiroyashu; Ito, Fumio; and Shinoda, Nobuhiko, 4,081,813, Cl. 354-289.000.
Shigeta, Yoshihiro; and Takahashi, Kiyoshi, 4,081,211, Cl. 352-130.000.
Cantrell, John H., Jr.: *See*—
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Capozello, Mathew. Truck door lock. 4,081,191, Cl. 292-197.000.
Carl Zeiss-Stiftung: *See*—
Flother, Werner, 4,081,812, Cl. 354-286.000.
Carosello, Theodore F., to Progressive Research Products, Inc. Insulation block and method of making same. 4,081,392, Cl. 252-62.000.
Carpenter, David R.; and Constien, Vernon G., to Dow Chemical Company, The. Aqueous based slurry with chelating agent and method of forming a consolidated gravel pack. 4,081,030, Cl. 166-276.000.
Carr, Delbert E.: *See*—
Carr, Virgil E.; and Carr, Delbert E., 4,080,943, Cl. 123-141.000.
Carr-Griff, Inc.: *See*—
Hartley, Ezra Dale, 4,081,621, Cl. 200-83.00Q.
Carr, Virgil E.; and Carr, Delbert E. Fuel charge atomizing device. 4,080,943, Cl. 123-141.000.
Carrington, Jeffery Neville, to Liquifry Company Limited. Aquaria filtration equipment. 4,081,377, Cl. 210-169.000.
Casey, Donald J.; and Gleckler, George C., to American Cyanamid Company. Suture or ligature carrying on the exposed surface thereof a coating of a polyester resin. 4,080,969, Cl. 128-335.500.
Caspar, Jean-Pierre: *See*—
Baudouin, Jacques; and Caspar, Jean-Pierre, 4,081,286, Cl. 106-306.000.
Baudouin, Jacques; and Caspar, Jean-Pierre, 4,081,287, Cl. 106-306.000.
Caspers, Hubert H., to United States of America, Navy. Low-loss signal coupler for optical communications and integrated optics. 4,081,672, Cl. 250-227.000.
Cassella Farbwerke Mainkur Aktiengesellschaft: *See*—
Michel, Walter; Honel, Hans; and Schon, Manfred, 4,081,426, Cl. 260-67.60R.
Castellion, George Augustus: *See*—
Schmitt, Joseph Lawrence, Jr.; Waker, Philip Leroy, Jr.; and Castellion, George Augustus, 4,081,370, Cl. 210-39.000.
Caterpillar Mitsubishi Ltd.: *See*—
Kozuki, Naoto, 4,081,202, Cl. 305-57.000.
Caterpillar Tractor Co.: *See*—
Bubula, Thomas J.; Franz, Maurice F.; Johnson, Gordon W.; and Rinaldo, James D., 4,080,850, Cl. 74-861.000.
Fuzzell, Joe E.; and Turnquist, Paul E., 4,080,940, Cl. 123-117.00D.
Gale, Preston Lee, 4,081,655, Cl. 219-121.0LM.
Hein, Allyn J., 4,080,979, Cl. 137-118.000.
Kranc, Stanley J., 4,081,140, Cl. 239-533.900.
Logsdon, John S., 4,081,051, Cl. 180-77.00S.
Yates, Jan B., 4,081,054, Cl. 180-139.000.
Cattell, Kerry Arthur; Moore, Roy Spencer; and Pearce, Jim, to Foseco International Limited. Mould assemblies for use in casting molten metals. 4,081,020, Cl. 164-122.000.
Cederstrand, Carl Nelson: *See*—
Neti, Radhakrishna Murty; and Cederstrand, Carl Nelson, 4,081,247, Cl. 23-232.00E.
Celmer, Walter D.; Cullen, Walter P.; Moppett, Charles E.; Routien, John B.; Jefferson, Mark T.; Shibakawa, Riichiro; and Tone, Junsuke, to Pfizer Inc. Polycyclic ether antibiotic produced by new species of dactylosporangium. 4,081,532, Cl. 424-122.000.
Centric Clutch Company: *See*—
Malmros, Edward T.; and Swart, Franz J., 4,081,063, Cl. 192-56.00F.
Cerberus AG: *See*—
Keller, Hansjurg, 4,081,680, Cl. 250-342.000.
Chalme, Gerard: *See*—
Dagonnet, Daniel; and Chalme, Gerard, 4,081,105, Cl. 220-263.000.
Chamberlin, Donald W.; and Irving, Donald W., to FMC Corporation. Apparatus for mechanically sorting fruit. 4,081,362, Cl. 209-74.00R.
Chambley, Phillip W.; and Norris, Alan H., to Champion International Corporation. Apparatus for depositing materials in a container. 4,080,772, Cl. 53-116.000.
Champion International Corporation: *See*—
Chambley, Phillip W.; and Norris, Alan H., 4,080,772, Cl. 53-116.000.
Liebrenz, Allan L.; O'Keefe, Verne D.; and Soderberg, Richard V., 4,080,825, Cl. 73-150.00A.
Chang, Peter J.Y. Caulking gun. 4,081,112, Cl. 222-391.000.
Chang, Wen-Hsuan: *See*—
Christenson, Roger M.; Bosso, Joseph F.; Hartman, Marvis E.; and Chang, Wen-Hsuan, 4,081,341, Cl. 204-181.00C.
Chapelsky, Orest; and Zausmer, Norman A., to Michlin Chemical Corporation. Tube connector for fluid container. 4,080,989, Cl. 137-588.000.
Chaplick, Adolph Michael, to USM Corporation. Method for stiffening shoe uppers. 4,080,680, Cl. 12-146.00D.
Chapman, Derek Davis; and Abbott, Thomas Irving, to Eastman Kodak Company. Photographic film units containing colorless paranitrobenzylidene dye-forming compounds. 4,081,275, Cl. 96-3.000.
Chatfield, Phillip A.; and Gullotti, Damian V., to Olin Corporation. Method for obtaining hollow articles. 4,080,702, Cl. 29-157.30V.
Checheljuk, Yakov Zinovievich; Pshenichny, Gennady Ivanovich; and

Mykalo, Nikolai Ivanovich. Machine for winding continuous electric windings. 4,081,003, Cl. 140-92.200.
Cheesman, Dean W., to University of California, Regents of the. Method of reducing mammalian fertility and drugs therefor. 4,081,533, Cl. 424-177.000.
Cheklich, George E.: *See—*
Vincent, Edward T.; and Cheklich, George E., 4,080,942, Cl. 123-139.0AT.
Chemische Industrie AKU-Goodrich B.V.: *See—*
Wietsma, Popke, 4,081,318, Cl. 162-157.00R.
Chemische Werke Huls Aktiengesellschaft: *See—*
Blumel, Harald; and Lipp, Paul, 4,081,502, Cl. 264-140.000.
Chen, Michael S.: *See—*
Block, Charles S.; Chen, Michael S.; Noichl, Olaf J.; and Hong, Sun-nan, 4,081,368, Cl. 210-14.000.
Chenoweth Development Laboratories, Inc.: *See—*
Mayland, Bertrand J., 4,081,517, Cl. 423-393.000.
Cheung, John B., to Flow Industries, Inc. Method and apparatus to remove structural concrete. 4,081,200, Cl. 299-17.000.
Chevron Research Company: *See—*
Fries, Bernard A., 4,081,688, Cl. 250-506.000.
Hutchison, Stanley O.; and Anderson, Glenn W., 4,081,032, Cl. 166-317.000.
Rogers, Earl E., 4,081,028, Cl. 166-242.000.
Chhuy, Lim Chheang; and Day, Edgar Allen, deceased (by Day, Esther Virginia, executrix), to International Flavors & Fragrances Inc. Edible compositions having a meat flavor and processes for making same. 4,081,565, Cl. 426-533.000.
Chibata, Ichiro; Tosa, Tetsuya; and Sato, Tadashi, to Tanabe Seiyaku Co., Ltd. Preparation of d-fructose. 4,081,327, Cl. 195-31.00F.
Chitre, Sanjeev R., to Sensor Technology, Inc. Complementary photovoltaic cell. 4,081,820, Cl. 357-30.000.
Christensen, Inc.: *See—*
Juergens, Rainer, 4,081,043, Cl. 175-297.000.
Christenson, Roger M.; Bosso, Joseph F.; Hartman, Marvis E.; and Chang, Wen-Hsuan, to PPG Industries, Inc. Use of polymeric quaternary ammonium hydroxides in electrodeposition. 4,081,341, Cl. 204-181.00C.
Christman, William J., to UOP Inc. Liquid-liquid extraction process. 4,081,354, Cl. 208-235.000.
Christmann, Marvin H.; Weiher, Richard L.; and Tait, William C., to Minnesota Mining and Manufacturing Company. Zinc oxide light emitting diode. 4,081,764, Cl. 331-94.50H.
Chupka, David E.: *See—*
Seifert, Peter; Chupka, David E.; Getz, Lynn L.; Hatton, Derald R.; Thomas, R. Marvin; Osso, John M.; and Rogl, Herbert A., 4,081,147, Cl. 241-261.300.
Ciba-Geigy AG: *See—*
Datye, Keshav Vinayak; Kangle, Purushottam J.; Milicevic, Branimir; Litzler, Alfred; and Koller, Eugen Johann, 4,081,240, Cl. 8-94.00A.
Ciba-Geigy Corporation: *See—*
Bateman, John H., 4,081,489, Cl. 260-668.00F.
Dear, Robert Ernest Arthur; and Cook, Thomas W., 4,081,399, Cl. 252-356.000.
Hari, Stefan; and Ronco, Karl, 4,081,439, Cl. 260-176.000.
Shen, Kwan Ting; and Pickering, Timothy L., 4,081,417, Cl. 260-29.2EP.
Spivack, John D., 4,081,475, Cl. 560-55.000.
Cicin-Sain, Yvo, to Matisa Industries S.A. Process and apparatus for laying ties for a railway track. 4,080,903, Cl. 104-6.000.
Cincinnati Electronics Corporation: *See—*
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Cincinnati Milacron-Heald Corporation: *See—*
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Ciric, Julius: *See—*
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Claassen, Volkert: *See—*
Welle, Hendricus Bernardus Antonius; and Claassen, Volkert, 4,081,551, Cl. 424-304.000.
Welle, Hendricus Bernardus Antonius; and Claassen, Volkert, 4,081,552, Cl. 424-304.000.
Clampitt, Bert H.; and Gilbert, Ronald E., to Gulf Oil Corporation. Process for the manufacture of ethylene-acrylic acid copolymers. 4,081,587, Cl. 526-54.000.
Claremont Wall Systems Company, Inc.: *See—*
Jastrabek, John, 4,080,766, Cl. 52-242.000.
Clark, Charles Wheeler: *See—*
Naidus, Edward Sidney; and Clark, Charles Wheeler, 4,080,763, Cl. 52-200.000.
Clark, Ivan Paul: *See—*
Moody, Norman Frank; and Clark, Ivan Paul, 4,080,832, Cl. 73-421.50R.
Clark, Jeremy, to Technex International Ltd. Electronic ringing circuit for telephone systems. 4,081,617, Cl. 179-84.00T.
Clark, Jeremy; and Allen, Robert, to Technex International Ltd. Electronic circuit for a speakerphone. 4,081,622, Cl. 179-81.00B.
Clarkson, Robert J.: *See—*
Moore, Thomas W.; Hager, Richard A.; and Clarkson, Robert J., 4,080,694, Cl. 28-170.000.
Clayton, Andrew Robert, to Brad Ragan, Inc. Siping machine. 4,081,016, Cl. 157-13.000.
Clayton, John Peter, to Beecham Group Limited. Penicillins. 4,081,545, Cl. 424-271.000.
Cleer, Clarence W., Jr., to Ridgway Steel Fabricators, Inc. Water jacket fabrication. 4,080,701, Cl. 29-157.30D.
Clegg, John E. Wire cutting pliers. 4,080,733, Cl. 30-102.000.
Clemar Manufacturing Corporation: *See—*
Morgan, Norman D.; and Pilz, Bodo, 4,081,171, Cl. 251-30.000.
Clement, Philippe: *See—*
Berthet, Jean-Pierre; Cailloux, Jean-Guy; and Clement, Philippe, 4,080,920, Cl. 114-244.000.
Clevepak Corporation: *See—*
Gardner, Roland C., 4,081,106, Cl. 220-359.000.
Cline, Harvey E.; and Anthony, Thomas R., to General Electric Company. Uniform thermomigration utilizing sample movement. 4,081,293, Cl. 148-1.500.
CM Systems, Inc.: *See—*
Heffron, Allan J.; Garnaat, Henry J.; and Kennedy, Laverne H., 4,080,852, Cl. 82-1.00C.
Coast Catamaran Corporation: *See—*
Alter, Hobart Laidlaw; and Blakely, Jerald Wayne, 4,080,917, Cl. 114-106.000.
Holland, Andrew MacDonald; and Arce, Henry Leyva, 4,080,919, Cl. 114-204.000.
Coblenz, William S.: *See—*
Prochazka, Svante; and Coblenz, William S., 4,081,284, Cl. 106-44.000.
Coccio, Ernest F.: *See—*
Evalds, Egils; and Coccio, Ernest F., 4,081,691, Cl. 307-41.000.
Coffey, Gerald P.: *See—*
Giddings, Brandford E.; Coffey, Gerald P.; Giffen, William M., Jr.; and Mazeke, Herbert F., 4,081,592, Cl. 526-248.000.
Cohen, Louis, to B. F. Goodrich Company, The. Internally coated reaction vessel for use in olefinic polymerization. 4,081,248, Cl. 23-285.000.
Coherent, Inc.: *See—*
Berg, Anthony D., 4,081,760, Cl. 331-94.50C.
Berg, Anthony D.; and Wise, William L., 4,081,765, Cl. 331-94.50C.
Cohn, Marvin, to Westinghouse Electric Corporation. Dual channel correlation radiometer. 4,081,679, Cl. 250-338.000.
Colecchio, Carl, to Lake City Manufacturing Co. Swivel for cargo binders and the like. 4,080,782, Cl. 59-9.000.
Coley, Kenneth R.; and Misencik, John J., to Westinghouse Electric Corporation. Ground fault circuit breaker. 4,081,852, Cl. 361-45.000.
Colli, Albert J., to United States of America, Navy. Process to remove iron sulfide from coal to reduce pollution. 4,081,251, Cl. 44-1.00R.
Collins, Clifford B.; and James, William G., to General Electric Company. Electrostatic coating of silica powders on incandescent bulbs. 4,081,709, Cl. 313-116.000.
Colt Industries Operating Corporation: *See—*
Thomas, Haydon C.; and Keen, Harry J., 4,081,801, Cl. 340-347.0AD.
Combustion Engineering, Inc.: *See—*
Barger, John Joseph; Blevins, Milton Lee; and Savor, Dennis Edward, 4,081,650, Cl. 219-60.00A.
Cook, John P., 4,080,905, Cl. 105-367.000.
Commissariat a l'Energie Atomique: *See—*
Aubert, Gilles; and Petit, Guy, 4,081,322, Cl. 176-37.000.
Aubert, Roger; and Baujat, Jacques, 4,081,325, Cl. 176-87.000.
Bompard, Bruno; Brochier, Jean; and Bruyere, Alain, 4,080,915, Cl. 112-412.000.
Compagnie des Etablissements de la Risle: *See—*
Patin, Claude Guy, 4,081,305, Cl. 156-204.000.
Compagnie Generale d'Electricite S.A.: *See—*
Jacquelin, Jean, 4,081,585, Cl. 429-23.000.
Compagnie Internationale pour l'Informatique Cii-Honeywell Bull: *See—*
Pichon, Michel, 4,080,829, Cl. 73-362.0AR.
Conair Corporation: *See—*
Tomaro, Patrick M., 4,081,135, Cl. 239-102.000.
Condon, Michael E.; Hauck, Frederic P.; and Reid, Joyce, to E. R. Squibb & Sons, Inc. Phenylpiperazinotetrahydronaphthols and derivatives. 4,081,444, Cl. 260-268.0PH.
Consecco A.G.: *See—*
Trixl, Georg, 4,080,768, Cl. 52-521.000.
Consolidated Foods Corporation: *See—*
Rosenacker, Arthur F., 4,081,205, Cl. 312-250.000.
Constien, Vernon G.: *See—*
Carpenter, David R.; and Constien, Vernon G., 4,081,030, Cl. 166-276.000.
Continental Oil Company: *See—*
Alexander, John D.; and Reed, Philip W., 4,080,837, Cl. 73-61.10R.
Gorin, Everett, 4,081,400, Cl. 252-415.000.
Yang, Kang; Reedy, James D.; and Lindberg, Robert C., 4,081,512, Cl. 423-240.000.
Conway, Bernard W., to Dexter Corporation, The. Continuous papermaking process. 4,081,319, Cl. 162-168.0NA.
Cook, Bill D., to United States of America, Health, Education and Welfare. Ultrasonic transducer calibration. 4,081,216, Cl. 356-256.000.
Cook, Charles R., Jr., to International Telephone and Telegraph Corporation. Semiconductor device having porous anodized aluminum isolation between elements thereof. 4,081,823, Cl. 357-47.000.
Cook, Harold, Jr.: *See—*
Rising, Paul Eugene; Jensen, James Wendell; and Cook, Harold, Jr., 4,081,104, Cl. 220-268.000.
Cook, John P., to Combustion Engineering, Inc. Schnabel railway car skid shipping assembly. 4,080,905, Cl. 105-367.000.

Cook, Thomas W.: *See—*
Dear, Robert Ernest Arthur; and Cook, Thomas W., 4,081,399, Cl. 252-356.000.

Cookson, Alan H., to Westinghouse Electric Corporation. Pipe coupling and method for using same. 4,081,599, Cl. 174-21.00C.

Coors Container Company: *See—*
Rising, Paul Eugene; Jensen, James Wendell; and Cook, Harold, Jr., 4,081,104, Cl. 220-268.000.

Copstead, Terrance R. Inflatable toy sword. 4,080,751, Cl. 46-1.00R.

Corbeil, Paul, to Peerless Electric Ltd. Lighting fixture for passenger vehicles. 4,081,665, Cl. 362-223.000.

Corbett, James Trail Sinclair, to Butterley Building Materials Limited. Kilns. 4,081,236, Cl. 432-3.000.

Cordes, Claus; and Sterzel, Hans-Josef, to Keil, Thompson & Shurtleff. Thermoplastic molding compositions from terephthalic acid-butane-1,4-diol-but-2-ene-1,4-diol polyesters. 4,081,422, Cl. 260-40.00R.

Corluy, Hans Josephus; Schelfaut, Francois Leon; Nys, Pierre Herman; and Bortels, Raoul Jan, to AGFA-GEVAERT N.V. Processing of photographic silver halide materials. 4,081,280, Cl. 96-50.00A.

Corning Glass Works: *See—*
Thorn, William B.; and Tobelmann, Jonathan G., 4,081,638, Cl. 200-84.00R.

Cornu, Jozef; and Sittig, Roland, to BBC Brown Boveri & Company Limited. Bistable semiconductor component for high frequencies having four zones of alternating opposed types of conductivity. 4,081,821, Cl. 357-38.000.

Corradini, Corrado, to Societa ' Ascensori Italiani Riuniti-S.A.I.R. Falconi-S.A.F.O.V. - S.p.A. Device for quick fastening one or more wire ropes to a solid body, such as an elevator car. 4,081,057, Cl. 187-1.00R.

Corrado, Joseph Michael: *See—*
Reines, Jose; Platt, Eric Gordon; White, Stanley Earl; Mahood, Robert John; and Corrado, Joseph Michael, 4,081,613, Cl. 179-18.00J.

Cotton Machinery Company, Inc.: *See—*
Pereira, Ernest G.; and Fitch, Guy W., 4,081,094, Cl. 214-355.000.

Courson, Richard B.; and Piontkowski, Henry, to Almo Manifold and Tool Company. Spray bars for metal rolling and flow control valves therefor. 4,081,141, Cl. 239-551.000.

CPC International Inc.: *See—*
Johnson, George Erick, 4,081,380, Cl. 210-332.000.

Cragoe, Edward J., Jr.; and Woltersdorf, Otto W., Jr., to Merck & Co., Inc. 1-Oxo-2,2-disubstituted-5-indanyloxy(or thio)alkano acids. 4,081,554, Cl. 424-317.000.

Crane, Dale Everett, to Lear Siegler, Inc. Saddle bag bracket. 4,081,117, Cl. 224-39.000.

Crankshaft Machine Co.: *See—*
Heffron, Allan J.; Garnaat, Henry J.; and Kennedy, Laverne H., 4,080,852, Cl. 82-1.00C.

Creusot-Loire: *See—*
Leroy, Pierre, 4,081,268, Cl. 75-52.000.

Crippa, Felice, to Inverni Della Beffa S.P.A. Polyhydroxyphenylchromanones. 4,081,529, Cl. 424-80.000.

Crist, Scott D., to Audio Research Corporation. Electromagnetic bipolar loud speaker. 4,081,627, Cl. 179-115.5PV.

Cristiani, Athos. Paper tape splicer for cigarette makers. 4,081,312, Cl. 156-504.000.

Crivello, James V., to General Electric Company. Photographic method. 4,081,276, Cl. 96-35.100.

Cronk, Edward R., to Thomas & Skinner, Inc. Ferromagnetic core with variable shunt air gap and method of making it. 4,080,725, Cl. 29-609.000.

Cronk, Edward R., to Thomas & Skinner, Inc. Ferromagnetic core with variable shunt air gap. 4,081,777, Cl. 336-165.000.

Crosby, Leslie O. Seed tape-bearing reflective plant marker. 4,080,755, Cl. 47-56.000.

Crowe, Norman P.; and Lohse, Joseph M., to Multifold-International, Inc. Discriminator supporting assembly. 4,081,181, Cl. 271-3.100.

Crowell, John Arnold; and Boutin, Jean Rene, to Du Pont de Nemours, E. I., and Company. Fluid dispensing and mixing apparatus. 4,081,006, Cl. 141-330.000.

Csom, Gyula; Desi, Sandor; Szolnay, Eva; Gyurkocza, Csaba; Szucs, Imre; Varbiro, Vilmos; Elo, Sandor; and Benedek, Sandor, to Budapesti Muszaki Egyetem. Measuring the concentration of boron in water. 4,081,683, Cl. 250-364.000.

Cullen, Walter P.: *See—*
Celmer, Walter D.; Cullen, Walter P.; Moppett, Charles E.; Routien, John B.; Jefferson, Mark T.; Shibakawa, Riichiro; and Tone, Junsuke, 4,081,532, Cl. 424-122.000.

Cunningham, Paul B., to Lenmar Industries, Inc. Internal combustion engine shut-down control valve. 4,080,946, Cl. 123-198.0DB.

Cunningham, Paul T.: *See—*
Hubble, Bill R.; Siegel, Stanley; and Cunningham, Paul T., 4,081,522, Cl. 423-542.000.

Curlett, John, to FMC Corporation. Method and apparatus for severing fibrous articles such as trees. 4,081,009, Cl. 144-309.0AC.

Curtis, Glenn Howard: *See—*
Parrillo, Henry; Harrington, John Sherman; and Curtis, Glenn Howard, 4,080,692, Cl. 26-91.000.

Curtiss-Wright Corporation: *See—*
Jones, Charles, 4,080,934, Cl. 123-205.000.

Cusano, Carmen M.: *See—*
Yamamoto, Roy I.; Cusano, Carmen M.; and Gaetani, Frank J., 4,081,385, Cl. 252-32.70E.

Cutler-Hammer, Inc.: *See—*
Piber, Earl T., 4,081,641, Cl. 200-153.0LA.

Dagonnet, Daniel; and Chalme, Gerard, to Societe Industrielle et Commerciale de Transformation des Plastiques "Sicopal". Pedal bin. 4,081,105, Cl. 220-263.000.

Dahlquist, James E.; and Singhi, Dilip T., to Rauland-Borg Corporation. Supervised single link telephone system. 4,081,614, Cl. 179-18.0AD.

Dai Nippon Printing Company Limited: *See—*
Shikaya, Yukihiro, 4,080,880, Cl. 93-94.00R.

Dai Nippon Toryo Co., Ltd.: *See—*
Hase, Takashi; Kagami, Akiyasu; Mimura, Yoshiyuki; Narita, Kinichiro; and Hiraki, Minoru, 4,081,398, Cl. 252-301.40R.

Daimler-Benz Aktiengesellschaft: *See—*
Ackel, Sabet, 4,081,197, Cl. 296-28.00R.
Gotz, Hans, 4,081,195, Cl. 296-1.00S.
Katz, Klaus; and Bordovsky, Jaromir, 4,080,871, Cl. 91-417.00R.
Wolters, Gerhard, 4,080,937, Cl. 123-32.00G.

Dandridge, Ernest M., Jr. Automotive vehicle transport system. 4,081,196, Cl. 296-1.00A.

Dao, Tich T.; and Tucci, Patrick A., to Signetics Corporation. Threshold integrated injection logic. 4,081,822, Cl. 357-44.000.

Datascope Corporation: *See—*
Bregman, David; Hanson, Bruce L.; and Wolvek, Sidney, 4,080,958, Cl. 128-1.00D.

Datye, Keshav Vinayak; Kangle, Purushottam J.; Milicevic, Branimir; Litzler, Alfred; and Koller, Eugen Johann, to Ciba-Geigy AG. Process for dyeing fully synthetic textile material. 4,081,240, Cl. 8-94.00A.

Davies, Terrence Ardern, to Plessey Handel Investments A.G. Electrical contact material. 4,081,644, Cl. 200-266.000.

Davis, Robert L.; and Domyan, Stephen L., to Summagraphics Corporation. Position coordinate determination device. 4,081,603, Cl. 178-19.000.

Davison, Sol: *See—*
Gergen, William P.; and Davison, Sol, 4,081,424, Cl. 260-42.180.

Dawidowitsch, Peter: *See—*
Geyken, Erwin; and Dawidowitsch, Peter, 4,081,816, Cl. 354-324.000.

Dawley, Richard W. Solar heat absorber. 4,080,956, Cl. 126-271.000.

Dawson, John Myrick, to TRW Inc. Isotope separation by magnetic fields. 4,081,677, Cl. 250-290.000.

Day, Edgar Allen, deceased: *See—*
Chhuy, Lim Chheang; and Day, Edgar Allen, deceased, 4,081,565, Cl. 426-533.000.

Day, Esther Virginia, executrix: *See—*
Chhuy, Lim Chheang; and Day, Edgar Allen, deceased, 4,081,565, Cl. 426-533.000.

Deal, Douglas O.; and Miller, Michael E., to Sam Stein Associates, Inc. Filter belt construction. 4,081,375, Cl. 210-122.000.

Dear, Robert Ernest Arthur; and Cook, Thomas W., to Ciba-Geigy Corporation. Process for the preparation of concentrated solutions of fluorinated amphoteric surfactants. 4,081,399, Cl. 252-356.000.

De Benedetti, Franco, to Gilardini S.p.A. Six-way deviator valve for liquids. 4,080,990, Cl. 137-599.100.

Decombe, Albert Alphonse; and Zanini, Gerard Alexandre, to ESCO Corporation. Method of repairing a dredge cutterhead. 4,080,708, Cl. 29-401.00F.

Dedinas, Jonas; and Fletcher, George Leland, Jr., to Eastman Kodak Company. Heat sensitive dye layers comprising a benzopinacol. 4,081,278, Cl. 96-48.0HD.

deFries, Jan Richard. Working cylinder for pneumatic or hydraulic pressure media. 4,080,877, Cl. 92-61.000.

De George, Robert P.; and Brown, Paul R., to Houdaille Industries, Inc. Tip table worktable section. 4,080,855, Cl. 83-71.000.

Deister Concentrator Co., Inc., The: *See—*
Stone, Spencer A., 4,080,840, Cl. 74-61.000.

Dekker, Cornelis M.: *See—*
Koblasz, Arthur J.; Fender, Derek H.; Yasui, Syozo; and Dekker, Cornelis M., 4,081,858, Cl. 364-553.000.

Delagrange, Arthur D.: *See—*
Wilson, Wayne D.; and Delagrange, Arthur D., 4,081,784, Cl. 340-3.00D.

DeLaval Turbine Inc.: *See—*
Moore, Edward H., 4,081,635, Cl. 200-81.90M.
Tice, Charles, 4,081,639, Cl. 200-84.00C.

Delente, Jacques J.; and Schoenfeld, Richard A., to Monsanto Company. Method of separating a Factor IX preparation from plasma using ethylene-maleic anhydride polymers. 4,081,432, Cl. 260-112.00B.

Delta Sonics, Inc.: *See—*
Edelson, Leon F., 4,081,706, Cl. 310-316.000.

Dempsey, Richard C., to International Telephone and Telegraph Corporation. Multioctave turnstile antenna for direction finding and polarization determination. 4,081,803, Cl. 343-795.000.

de Niet, Edmond: *See—*
van den Enden, Adrianus Wilhelmus Maria; de Niet, Edmond; and Deurwaarder, Marinus Adriaan, 4,081,855, Cl. 361-203.000.

Denka Chemical Corporation: *See—*
Kerr, Ralph O.; and Strybos, Gabe W., Jr., 4,081,460, Cl. 260-346.750.

DePriest, Donald R.; Brandon, Bobby C.; and Buie, Connell M., to Humboldt Products Corporation. Method of making surgical drapes. 4,081,306, Cl. 156-250.000.

de Putter, Warner Jan: *See—*
Bulters, Hein; Heidemann, Gerrit; and de Putter, Warner Jan, 4,080,999, Cl. 138-125.000.

Desai, Saurabhkumar J.: *See*—
Armstrong, William W.; and Desai, Saurabhkumar J., 4,081,527, Cl. 424-80.000.
Deschamps, Andre: *See*—
Gruhier, Henri; Deschamps, Andre; and Renault, Philippe, 4,081,515, Cl. 423-351.000.
Desi, Sandor: *See*—
Csom, Gyula; Desi, Sandor; Szolnay, Eva; Gyurkocza, Csaba; Szucs, Imre; Varbiro, Vilmos; Elo, Sandor; and Benedek, Sandor, 4,081,683, Cl. 250-364.000.
Design & Manufacturing Corporation: *See*—
Niederer, Otto C., 4,080,992, Cl. 137-636.000.
Desmarchais, Walter E.: *See*—
Shallenberger, John M.; Hornak, Leonard P.; and Desmarchais, Walter E., 4,081,086, Cl. 214-2.000.
DeSoto, Inc.: *See*—
Berenschot, Donald J.; Anders, Dale F.; and Hawker, Fred D., 4,081,416, Cl. 260-29.4UA.
Dessau, Ralph M.: *See*—
Heiba, El Ahmadi I.; and Dessau, Ralph M., 4,081,456, Cl. 260-326.250.
Determann, Helmut: *See*—
Jaworek, Dieter; Botsch, Karl-Heinz; Weimann, Gunter; Nelbock-Hochstetter, Michael; and Determann, Helmut, 4,081,329, Cl. 195-63.000.
Deurwaarder, Marinus Adriaan: *See*—
van den Enden, Adrianus Wilhelmus Maria; de Niet, Edmond; and Deurwaarder, Marinus Adriaan, 4,081,855, Cl. 361-203.000.
Deutsche Gold- und Silber-Scheideanstalt vormals Roessler: *See*—
Hensel, Jorg; Koberstein, Edgar; and Lakatos, Eduard, 4,081,576, Cl. 427-385.00C.
Deutsche Texaco Aktiengesellschaft: *See*—
Wilms, Elmar; and Michalczyk, Georg, 4,081,404, Cl. 252-439.000.
Devore, Ernest William; and McDowell, Judson Allen, to International Business Machines Corporation. Interleaved synch and beginning of data indicators. 4,081,844, Cl. 360-48.000.
Devy, Robert C.; and Salmon, Jean P., to Jeumont-Schneider. Fail-safe cab signal process for transmitting information by high-voltage pulsed track circuits, and apparatus for carrying the process into effect. 4,081,160, Cl. 246-63.00C.
de Wilde, Gerrit; and Weiss, Gunther. Solar collector apparatus. 4,080,954, Cl. 126-270.000.
Dexter Corporation, The: *See*—
Conway, Bernard W., 4,081,319, Cl. 162-168.0NA.
Diamond International Corporation: *See*—
Reifers, Richard F., 4,081,123, Cl. 229-2.5EC.
Diamond Shamrock Corporation: *See*—
Hora, Charles J.; and Babinsky, Andrew D., 4,081,349, Cl. 204-252.000.
Dick, Thomas Hutcheson: *See*—
Queen, David Stewart; Bell, Peter William; Dick, Thomas Hutcheson; and Edgar, John Black, 4,081,579, Cl. 428-95.000.
Didier Engineering GmbH: *See*—
Laue, Karl Heinrich; Sander, Theo; Sauder, Peter; and Uckert, Gotthard, 4,081,511, Cl. 423-239.00A.
Diker, Charles Michael: *See*—
Moe, Walter; Diker, Charles Michael; and Bernstein, Lawrence Allen, 4,081,145, Cl. 241-93.000.
Diker-Moe Associates: *See*—
Moe, Walter; Diker, Charles Michael; and Bernstein, Lawrence Allen, 4,081,145, Cl. 241-93.000.
Dilg, Walter Cabble: *See*—
Glauser, Wilbert Gordon; and Dilg, Walter Cabble, 4,081,083, Cl. 213-76.000.
Dilling, Roy. Log splitter. 4,081,008, Cl. 144-193.00A.
Dinella, Donald; and Kovaric, Richard M., to Western Electric Co., Inc. Bonding contact members to circuit boards. 4,081,601, Cl. 174-68.500.
Dippel, Charles, to Cincinnati Electronics Corporation. Scanning lens system. 4,081,207, Cl. 350-6.400.
Distillers Company (Yeast) Limited, The: *See*—
Grylls, Frederick S. M.; Rennie, Stanley D.; and Kelly, Michael, 4,081,558, Cl. 426-62.000.
Dodwell, Glenn W.: *See*—
Sand, Leonard B.; and Dodwell, Glenn W., 4,081,514, Cl. 423-328.000.
Dolan, James J.: *See*—
Janatka, Vladimir; and Dolan, James J., 4,081,296, Cl. 148-16.000.
Dold, Hildegard, heir: *See*—
Dold, Siegfried, deceased, 4,081,097, Cl. 215-252.000.
Dold, Siegfried, deceased (by Dold, Hildegard, heir), to Underberg Gesellschaft mit beschrankter Haftung. Safety closure for bottles. 4,081,097, Cl. 215-252.000.
Dolza, John, Sr. Split engine control system. 4,080,948, Cl. 123-198.00F.
Domyan, Stephen L.: *See*—
Davis, Robert L.; and Domyan, Stephen L., 4,081,603, Cl. 178-19.000.
Donaldson, Desmond M., to Borg-Warner Corporation. Multiple fluid stacked plate heat exchanger. 4,081,025, Cl. 165-140.000.
Donnelly, William R., to Readi Temp, Inc. Endothermic composition and cold pack. 4,081,256, Cl. 62-4.000.
Donofrio, David Michael: *See*—
Hulls, John Robin; and Donofrio, David Michael, 4,081,367, Cl. 210-11.000.
Dore, James E.: *See*—
Yarwood, John C.; Dore, James E.; and Preuss, Robert K., 4,081,371, Cl. 210-69.000.
Dorma-Baubeschlag G.m.b.H. & Co. K.G.: *See*—
Jentsch, Dietrich, 4,080,687, Cl. 16-52.000.
Dornier System GmbH.: *See*—
Neumann, Gerhard, 4,081,702, Cl. 310-49.00R.
Doroszkowski, Andrew; and Nicks, Peter Francis, to Imperial Chemical Industries Limited. Coating compositions. 4,081,412, Cl. 260-22.0CQ.
Doss, Desmond T., Jr. Clamp for tubular bodies. 4,081,170, Cl. 251-5.000.
Dougherty, Charles B.: *See*—
Augenstein, Bruno W.; and Dougherty, Charles B., 4,080,900, Cl. 102-67.000.
Dow Chemical Company, The: *See*—
Carpenter, David R.; and Constien, Vernon G., 4,081,030, Cl. 166-276.000.
Dreher, George L., to Beloit Corporation. Variable nip minimum wrap calender. 4,080,890, Cl. 100-170.000.
Dresser Industries, Inc.: *See*—
Glauser, Wilbert Gordon; and Dilg, Walter Cabble, 4,081,083, Cl. 213-76.000.
Lane, John Jay, 4,081,185, Cl. 277-212.00C.
Drostholm, Frede Hilmar; and Meyer, Leonard S., to Drostholm, Frede Hilmar. Method for making tubular resin elements such as pipes. 4,081,302, Cl. 156-190.000.
Droughton, John V.: *See*—
Walsh, Robert M.; and Droughton, John V., 4,080,667, Cl. 4-415.000.
D'Silva, Themistocles D. J., to Union Carbide Corporation. Ketoalkanesulfenyl and ketoalkanethiosulfenyl carbamates. 4,081,550, Cl. 424-298.000.
D'Silva, Themistocles Damasceno Joaquim, to Union Carbide Corporation. Carbamic pesticidal compositions. 4,081,454, Cl. 424-304.000.
Dufour, Raymond J.: *See*—
Rush, William F.; Wurm, Jaroslav; and Dufour, Raymond J., 4,081,024, Cl. 165-62.000.
Dumas, Jean-Claude, to Societe Generale de Constructions Electriques et Mecaniques Alsthom S.A. Sectional iron for articulated fitting, more particularly for a vehicle body structure. 4,081,189, Cl. 285-137.00R.
Dumont, Alain G., to Jeumont-Schneider. Method of and apparatus for eliminating the side tone of a telephone station. 4,081,616, Cl. 179-81.00A.
Dunlop Limited: *See*—
Mitchell, William Eric, 4,081,015, Cl. 152-379.100.
Searle, Eric Henry, 4,081,014, Cl. 152-330.00L.
Dunn, Wendell E., Jr., to Titanium Technology N.V. Process for removing chemisorbed and interstitial chlorine and chlorides from a hot titanium dioxide beneficiate-carbon mixture. 4,081,507, Cl. 423-74.000.
Du Pont de Nemours, E. I., and Company: *See*—
Adams, Dustin Stetson; Field, Frederick C., Jr.; and Layton, James Ronald, 4,080,778, Cl. 57-157.00S.
Crowell, John Arnold; and Boutin, Jean Rene, 4,081,006, Cl. 141-330.000.
Manos, Philip, 4,080,743, Cl. 34-9.000.
Manos, Philip, 4,080,744, Cl. 34-9.000.
Nieuweboer, Gerrit, 4,081,686, Cl. 250-480.000.
Resnick, Paul Raphael, 4,081,466, Cl. 260-544.00F.
Resnick, Paul Raphael, 4,081,467, Cl. 260-544.00F.
Shearon, Michael Hillas, 4,080,856, Cl. 83-99.000.
Durand, Kevin James: *See*—
Mendelsohn, Lewis Isaac; Durand, Kevin James; and Nesbitt, Ethan Allen, 4,081,298, Cl. 148-121.000.
Durbin, John R. Flow line counter incorporating programmed reversal circuitry. 4,081,661, Cl. 235-92.0EV.
Duriez, Jean; and Evin, Jean. Control apparatus. 4,081,058, Cl. 187-29.00R.
Duteurtre, Philippe: *See*—
Soula, Gerard; and Duteurtre, Philippe, 4,081,388, Cl. 252-51.50A.
Dykmans, Maximiliaan J. Coupler. 4,081,219, Cl. 403-43.000.
E M I Limited: *See*—
Pearce, Ralph Reginald, 4,081,132, Cl. 235-493.000.
E. R. Squibb & Sons, Inc.: *See*—
Condon, Michael E.; Hauck, Frederic P.; and Reid, Joyce, 4,081,444, Cl. 260-268.0PH.
Eagen, John F.: *See*—
West, Theodore H.; Eagen, John F.; and Gudelis, David A., 4,081,352, Cl. 208-36.000.
Eagle, John. Water level alarm apparatus. 4,080,985, Cl. 137-429.000.
Eakins, Paul W., to Foster Brothers Manufacturing Company, The. Sofa bed folding fixture. 4,080,672, Cl. 5-13.000.
Earle, Ernest Lord, Jr.: *See*—
Meyer, Franklyn Wallace; Pitchon, Esra; and Earle, Ernest Lord, Jr., 4,081,561, Cl. 426-385.000.
East, George H., Jr.: *See*—
Mottola, Elia A.; East, George H., Jr.; Goldstein, Norman A.; Huang, Wu-Cheng; Peech, John M.; Pirotin, Shelden D.; Roemer, Robert E.; and Spada, Albert J., 4,080,998, Cl. 138-107.000.
Eastman Kodak Company: *See*—
Blanding, Douglass Lane, 4,081,848, Cl. 360-109.000.
Brault, Albert Thomas; Light, William Andrew; and Martin, Thomas William, 4,081,277, Cl. 96-38.200.

Chapman, Derek Davis; and Abbott, Thomas Irving, 4,081,275, Cl. 96-3.000.
Dedinas, Jonas; and Fletcher, George Leland, Jr., 4,081,278, Cl. 96-48.0HD.
Goffe, Charles A., deceased; Heseltine, Donald W.; and Bernard, Robert E., 4,081,279, Cl. 96-48.0HD.
Hipwell, William E. H., 4,081,827, Cl. 358-14.000.

Eaton, Crosby J. Fetus scalp electrode instrument. 4,080,961, Cl. 128-2.06E.

Eaton, Homer L., to Eaton-Leonard Corporation. Set-up guide for bending machine. 4,080,814, Cl. 72-32.000.

Eaton-Leonard Corporation: *See—*
Eaton, Homer L., 4,080,814, Cl. 72-32.000.

Eberle, William J., to General Battery Corporation. Enveloper for wrapping the plates of an automotive storage battery. 4,080,732, Cl. 29-730.000.

Eberle, William J., to General Battery Corporation. Apparatus for dumping and collecting corrosive substances from automotive batteries. 4,081,093, Cl. 214-314.000.

Eckstein, Paul; Jantsch, Ottomar; and Reimann, Bernd, to Siemens Aktiengesellschaft. Pressure transducer. 4,080,830, Cl. 73-719.000.

Edelson, Leon F., to Delta Sonics, Inc. Oscillatory circuit for an ultrasonic cleaning device with feedback from the piezoelectric transducer. 4,081,706, Cl. 310-316.000.

Edelstein, Fred; Haslett, Robert A.; and Sangesland, Odd E., to Grumman Aerospace Corporation. Heat pipes to use heat from light fixtures. 4,081,023, Cl. 165-53.000.

Edgar, John Black: *See—*
Queen, David Stewart; Bell, Peter William; Dick, Thomas Hutcheson; and Edgar, John Black, 4,081,579, Cl. 428-95.000.

Edilstart S.r.l.: *See—*
Fasano, Osvaldo, 4,080,765, Cl. 52-228.000.

Edling, Porter Russell; and Reusswig, Gerhard Helmut, to Offshore Company, The. Bottom-supported vessel for performing subaqueous operations and method of placing a bottom-supported vessel in position for performing subaqueous operations. 4,080,796, Cl. 61-88.000.

Eggelsmann, Harry: *See—*
Hartl, Walter; Eggelsmann, Harry; and Hodum, Claus-Peter, 4,081,707, Cl. 313-60.000.

Eggerts, Ragnars Martin: *See—*
Sperber, Martin; Eggerts, Ragnars Martin; and Scherer, George, 4,081,839, Cl. 358-186.000.

Eguchi, Tsukasa. Hydroquinone-ketone molecular compound and process for purifying hydroquinone using said molecular compound. 4,081,485, Cl. 260-621.00A.

Eisele, Jean Paul. Child-proof match container. 4,081,076, Cl. 206-106.000.

Eklange, Bo Roland: *See—*
Hoden, Ebbe Sigfrid; and Eklange, Bo Roland, 4,080,879, Cl. 93-94.00R.

Eli Lilly and Company: *See—*
Flaugh, Michael E., 4,081,458, Cl. 260-335.000.
Kukolja, Stjepan, 4,081,440, Cl. 260-239.00A.
Zimmerman, Dennis M., 4,081,450, Cl. 260-293.670.

Elias, Robert T.: *See—*
Butterworth, George A. M.; Elias, Robert T.; and Miller, Wayne D., 4,081,582, Cl. 428-284.000.

Elion, Gertrude B.; and Strelitz, Robert A., to Burroughs Wellcome Co. Amino purine nucleosides as autoimmune suppressant agents. 4,081,534, Cl. 424-180.000.

Elkem-Spigerverket A/S: *See—*
Kopperstad, Leif; and Opedal, Halldor, 4,081,178, Cl. 266-158.000.

Elkhart Brass Mfg. Co., Inc.: *See—*
Thompson, William S., 4,081,172, Cl. 251-93.000.

Elliott Brothers (London) Limited: *See—*
Heller, Fritz Peter; and Ellis, Stafford Malcolm, 4,081,209, Cl. 350-174.000.

Ellis, Stafford Malcolm: *See—*
Heller, Fritz Peter; and Ellis, Stafford Malcolm, 4,081,209, Cl. 350-174.000.

Elmessaar, Heino: *See—*
Andersson, Sture R.; Blomberg, Jarl J.; and Elmessaar, Heino, 4,081,038, Cl. 173-162.000.

Elmore, Richard E.; and Plumb, Richard L., to United States of America, Navy. Radar and navigation chart overlay video display system. 4,081,802, Cl. 343-5.0ST.

Elo, Sandor: *See—*
Csom, Gyula; Desi, Sandor; Szolnay, Eva; Gyurkocza, Csaba; Szucs, Imre; Varbiro, Vilmos; Elo, Sandor; and Benedek, Sandor, 4,081,683, Cl. 250-364.000.

Emerson Electric Co.: *See—*
Bhat, Vasanth K.; Siegel, Allen E.; Vogel, Richard E.; and Burrows, Larry G., 4,080,944, Cl. 123-145.00A.

Emerson, Grahame W., to Merit Abrasive Products, Inc. Flexible polishing drum segment and method of making and mounting same. 4,080,714, Cl. 29-509.000.

EMI Limited: *See—*
Froggatt, Robert Justin, 4,081,681, Cl. 250-360.000.

Ender, Gunter; Schultz, Helmut; Thiele, Hartmut; Gruber, Leo; Kober, Heinrich; Bottcher, Werner; and Macheiner, Tibor, to AGFA-Gevaert, A.G. Stackable winding cores for magnetic tapes. 4,081,151, Cl. 242-68.500.

Enders, Burkhard: *See—*
Porzsolt, Franz; Tautz, Christoph; Schmidtberger, Rudolf; Ax, Wolfgang; and Enders, Burkhard, 4,081,241, Cl. 23-230.00B.

Engelhard Minerals & Chemicals Corporation: *See—*
Lepetic, Vuko M., 4,081,364, Cl. 209-167.000.

Engelman, Karl: *See—*
McNally, Robert T.; Engelman, Karl; and Noordergraaf, Abraham, 4,080,966, Cl. 128-214.00E.

English Electric Valve Company Limited: *See—*
Molyneux-Berry, Robert Bewes, 4,081,719, Cl. 315-350.000.

English, Paul Everitt; Ashcroft, Ian Reginald; and Bosher, David Robert, to British Steel Corporation. Temperature measurement sensor. 4,081,291, Cl. 136-232.000.

Envirometrix, Inc.: *See—*
Nalbandian, Noubar; Holmes, David P.; and Fletcher, Alan B., 4,080,909, Cl. 110-235.000.

Eocom Corporation: *See—*
Harbaugh, Steven K.; and Amtower, Richard E., 4,081,842, Cl. 358-256.000.

Epes, Archie C. Building press. 4,081,120, Cl. 227-113.000.

Eppensteiner, Frederick W.; and Steinecker, Carl, to Richardson Company, The. Alkaline bright zinc plating and additive therefor. 4,081,336, Cl. 204-55.00Y.

Erco Industries Limited: *See—*
Swindells, Richard; and Fredette, Maurice C. J., 4,081,520, Cl. 423-478.000.

Erickson Tool Company: *See—*
Benjamin, Milton Lloyd; Walker, David Dean; and Miles, Wilbur Nelson, 4,080,849, Cl. 74-813.00R.

ESCO Corporation: *See—*
Decombe, Albert Alphonse; and Zanini, Gerard Alexandre, 4,080,708, Cl. 29-401.00F.

Esola, John L., to Rockwell International Corporation. Unidirectional index drive for gas meters. 4,080,827, Cl. 73-275.000.

Essex Cryogenics Industries, Inc.: *See—*
Spaulding, Roy H.; and Snyder, Fred P., 4,080,800, Cl. 62-51.000.

Etat Francais represente par le Delegue Ministeriel pour l'Armement: *See—*
Berthet, Jean-Pierre; Cailloux, Jean-Guy; and Clement, Philippe, 4,080,920, Cl. 114-244.000.
Richard, Monique-Jeanne-Marie, 4,081,786, Cl. 340-10.000.

Ethyl Corporation: *See—*
Ashby, Eugene C., 4,081,524, Cl. 423-644.000.
Lanier, Carroll W.; and Kao, James T. F., 4,081,593, Cl. 536-57.000.

Evalds, Egils; and Coccio, Ernest F., to Athena Controls Inc. Controller for a multiple stage power device having interchangeable control units. 4,081,691, Cl. 307-41.000.

Evans, Arthur J., to Whitlock, Inc. Flexible membrane discharge for-vacuum hopper. 4,081,110, Cl. 222-203.000.

Evans, Dennis Ernest Mackley; and Robson, Edwin, to Imperial Chemical Industries Limited. Vinyl chloride polymerization process. 4,081,588, Cl. 526-87.000.

Evans, Gary L. System for filtering stack gases. 4,081,255, Cl. 55-230.000.

Evers, William J.; Heinsohn, Howard H., Jr.; and Vock, Manfred Hugo, to International Flavors & Fragrances Inc. 2-Mercaptocyclododecanone-1. 4,081,480, Cl. 260-586.00M.

Evertz, Herbert; and Geis, Hans Peter. Springing device particularly for vehicles. 4,081,187, Cl. 280-701.000.

Evin, Jean: *See—*
Duriez, Jean; and Evin, Jean, 4,081,058, Cl. 187-29.00R.

Exxon Nuclear Company Inc.: *See—*
Flora, Barney S.; and Patterson, John F., 4,081,324, Cl. 176-78.000.

Exxon Production Research Company: *See—*
Thompson, Gene D., 4,080,797, Cl. 61-103.000.

Exxon Research & Engineering Co.: *See—*
Berthelot, Jean-Paul; and Marin, Pierre Dominique, 4,081,393, Cl. 252-63.000.
Kennedy, Joseph P., 4,081,590, Cl. 526-185.000.
Li, Norman N. Edison; Cahn, Robert P.; and Shrier, Adam L., 4,081,369, Cl. 210-22.00R.
Luckenbach, Edward C., 4,081,508, Cl. 423-210.000.
Nadler, Murray; and Cahn, Robert P., 4,080,791, Cl. 60-670.000.
Sawyer, Willard H., 4,081,405, Cl. 252-455.00R.
Sawyer, Willard H., 4,081,406, Cl. 252-455.00R.
Swinney, Brian; and Scattergood, Roger, 4,081,389, Cl. 252-52.00R.
West, Theodore H.; Eagen, John F.; and Gudelis, David A., 4,081,352, Cl. 208-36.000.

Fabcon International, Inc.: *See—*
Torres, Julio C., 4,081,288, Cl. 127-48.000.

Fabrica Italiana Lapis ed Affini (Fila) SpA: *See—*
Galli, Luigi, 4,081,010, Cl. 145-3.100.

Fabrizio, Leonard A.: *See—*
Tybus, Axel W.; and Fabrizio, Leonard A., 4,081,413, Cl. 260-23.0XA.

Fainberg, Evgeny Borisovich: *See—*
Glikman, Mark Leonovich; Tjurin, Jury Mikhailovich; Gorshkov, Gennady Nikolaevich; Gorokhovsky, Vladilen Alexandrovich; Shabanov, Alexei Georgievich; Sapunar, Zakhar Isaevich; Avrus, Albert Vladimirovich; and Fainberg, Evgeny Borisovich, 4,081,260, Cl. 65-25.00A.

Falk, James B. High deflection constant speed universal joint. 4,080,804, Cl. 64-21.000.

Falticko, Stefan: *See—*
Bohmer, Walter; and Falticko, Stefan, 4,081,227, Cl. 425-65.000.

Fasano, Osvaldo, to Edilstart S.r.l. Building structure made of preformed reinforced elements. 4,080,765, Cl. 52-228.000.

Feder, Alvin, to Motorola, Inc. Dual purpose, weather resistant data

terminal keyboard assembly including audio porting. 4,081,631, Cl. 200-5.00A.

Fein, Michael E.: *See—*
Bode, Wolfgang W.; and Fein, Michael E., 4,081,712, Cl. 313-226.000.

Fender, Derek H.: *See—*
Koblasz, Arthur J.; Fender, Derek H.; Yasui, Syozo; and Dekker, Cornelis M., 4,081,858, Cl. 364-553.000.

Fentress, Gene. Mounting assembly. 4,081,165, Cl. 248-205.00R.

Ferres, Harry, to Beecham Group Limited. 3-Substituted aminocycloalkyl esters of penicillin antibiotics. 4,081,546, Cl. 424-271.000.

Fex, Hans Jacob; Kristensson, Sten Krister; and Stamvik, Anders Robert, to Aktiebolaget Leo. Acylation process for the preparation of phenolic N-disubstituted carbamate esters, and ion pair solution for use in the process. 4,081,461, Cl. 260-397.400.

Field, Frederick C., Jr.: *See—*
Adams, Dustin Stetson; Field, Frederick C., Jr.; and Layton, James Ronald, 4,080,778, Cl. 57-157.00S.

Filters International Inc.: *See—*
White, Eugene B.; and Sharma, Mahindar N., 4,081,365, Cl. 210-3.000.

Filtrox Maschinenbau AG: *See—*
Strub, Fritz, 4,081,376, Cl. 210-143.000.

Finlayson, Claude Malcolm, to N L Industries, Inc. Thixotropic polyester compositions containing an organophilic clay gellant. 4,081,496, Cl. 260-864.000.

Finnigan Corporation: *See—*
Smith, Ronald D.; Frankel, Steven B.; Reeher, John R.; and Story, Michael S., 4,081,222, Cl. 417-153.000.

Fischer, Ronald H.; Ciric, Julius; and Whyte, Thaddeus E., Jr., to Mobil Oil Corporation. Catalyst composition. 4,081,408, Cl. 252-465.000.

Fischwick, Brian Ribbons: *See—*
Baird, David Boyd; Fischwick, Brian Ribbons; Campbell, James Stanley; and Smith, Peter, 4,081,435, Cl. 260-156.000.

Fishman, Sherman S. Rimlatch to deadbolt lock converter accessory. 4,080,810, Cl. 70-129.000.

Fitch, Guy W.: *See—*
Pereira, Ernest G.; and Fitch, Guy W., 4,081,094, Cl. 214-355.000.

Fixel, Irving E. Implantable prosthetic bone device. 4,080,666, Cl. 3-1.910.

Flaschar, Heinz; Kroll, Peter; Thomassen, Petrus; Kleinschmidt, Heinz; and Preun, Hugo, to Robert Bosch GmbH. Control arrangement for supplying pressure fluid to at least two hydraulically operated consumer devices. 4,080,994, Cl. 137-596.130.

Flaugh, Michael E., to Eli Lilly and Company. Anti-androgen compounds. 4,081,458, Cl. 260-335.000.

Fleer, Ernst Otto, to Siemens Aktiengesellschaft. Coupling device for dental handpieces. 4,080,737, Cl. 32-22.000.

Fleming, Ian George Cameron; and Jones, Raymond Vincent Heavon, to Imperial Chemical Industries Limited. Process for the manufacture of pyrazolones from pyrazolidones. 4,081,597, Cl. 548-363.000.

Fletcher, Alan B.: *See—*
Nalbandian, Noubar; Holmes, David P.; and Fletcher, Alan B., 4,080,909, Cl. 110-235.000.

Fletcher, George Leland, Jr.: *See—*
Dedinas, Jonas; and Fletcher, George Leland, Jr., 4,081,278, Cl. 96-48.0HD.

Fliegelman, Helen, administratrix: *See—*
Fliegelman, Ronald, deceased; and Fliegelman, Helen, administratrix, 4,081,116, Cl. 224-5.00A.

Fliegelman, Ronald, deceased; and Fliegelman, Helen, administratrix. Gaff hook holder. 4,081,116, Cl. 224-5.00A.

Flora, Barney S.; and Patterson, John F., to Exxon Nuclear Company Inc. Spacer capture rod to spacer grid attachment device. 4,081,324, Cl. 176-78.000.

Flother, Werner, to Carl Zeiss-Stiftung. Photographic lens with perspective-adjustment feature. 4,081,812, Cl. 354-286.000.

Flow Industries, Inc.: *See—*
Cheung, John B., 4,081,200, Cl. 299-17.000.

FMC Corporation: *See—*
Chamberlin, Donald W.; and Irving, Donald W., 4,081,362, Cl. 209-74.00R.
Curlett, John, 4,081,009, Cl. 144-309.0AC.
Scharpf, William George, 4,081,488, Cl. 260-654.00R.
Youmans, Donald W., 4,081,049, Cl. 180-43.00C.

Fogg, Daniel A., to Gerber Products Company. Hydraulic safety valve. 4,080,987, Cl. 137-464.000.

Fogo, Denis S.; and Skaggs, Roy W., Jr., to Oxy Metal Industries Corporation. Horizontal oscillating treating barrel apparatus. 4,081,346, Cl. 204-213.000.

Ford Motor Company: *See—*
Abdoo, Richard V., 4,081,694, Cl. 307-129.000.
Gabriel, Martin G., 4,081,218, Cl. 403-24.000.
Golovoy, Amos, 4,081,338, Cl. 204-149.000.
Holloway, Henry, 4,080,723, Cl. 29-584.000.
Kantz, Don B., 4,080,788, Cl. 60-517.000.

Forshee, Edward. Balance control water screen. 4,081,374, Cl. 210-116.000.

Forster, Karl-Heinz: *See—*
Vetter, Lothar; Forster, Karl-Heinz; and Schanze, Klaus, 4,081,723, Cl. 318-38.000.

Foseco International Limited: *See—*
Cattell, Kerry Arthur; Moore, Roy Spencer; and Pearce, Jim, 4,081,020, Cl. 164-122.000.

Foseco Trading, A.G.: *See—*
Atterbury, Robert Edwin, 4,081,168, Cl. 249-106.000.

Foster Brothers Manufacturing Company, The: *See—*
Eakins, Paul W., 4,080,672, Cl. 5-13.000.

Foster, Gene B., to Boeing Company, The. Pinch and forming roll assembly for numerically controlled contour forming machines. 4,080,815, Cl. 72-168.000.

Foster Wheeler Energy Corporation: *See—*
Gibson, Thomas; and Hillis, Roger W., 4,080,933, Cl. 122-336.000.

Frame, Ronald A. Circle cutter. 4,081,179, Cl. 266-70.000.

Franck, Gerald R., to Minnesota Mining and Manufacturing Company. Compartmented package. 4,081,077, Cl. 206-219.000.

Frank, Earl E., to Abex Corporation. Railroad frogs. 4,081,162, Cl. 246-458.000.

Frank, Pierre; and Sailer, Andre Louis, to Produits Chimiques Ugine Kuhlmann. Water soluble polyazo dyestuffs. 4,081,437, Cl. 260-159.000.

Frankel, Steven B.: *See—*
Smith, Ronald D.; Frankel, Steven B.; Reeher, John R.; and Story, Michael S., 4,081,222, Cl. 417-153.000.

Franz, Maurice F.: *See—*
Bubula, Thomas J.; Franz, Maurice F.; Johnson, Gordon W.; and Rinaldo, James D., 4,080,850, Cl. 74-861.000.

Frazzini, Thomas G., to Asbury Industries, Inc. Loader bucket assembly for earth working equipment. 4,080,746, Cl. 37-117.500.

Fredette, Maurice C. J.: *See—*
Swindells, Richard; and Fredette, Maurice C. J., 4,081,520, Cl. 423-478.000.

Fredman, Harry; and Fredman, Irving. Bed rails with center bar support. 4,080,674, Cl. 5-310.000.

Fredman, Irving: *See—*
Fredman, Harry; and Fredman, Irving, 4,080,674, Cl. 5-310.000.

Freeman, James Edward; Bagnall, Arthur Francis; and by McKenzie, Marion, legal representative, to McKenzie, John, deceased. Production of plied yarn. 4,080,779, Cl. 57-160.000.

Freeman, Richard B., Sr. Pipe laydown and pickup machine. 4,081,087, Cl. 214-2.500.

Frei, Dieter, to Sulzer Brothers Limited. Steam generator. 4,080,789, Cl. 60-658.000.

Freitag, Dieter; Nouvertne, Werner; and Kleiner, Frank, to Bayer Aktiengesellschaft. Thermoplastic moulding compositions and mouldings of polycarbonates, with improved ease of mould release when injection-moulded. 4,081,495, Cl. 260-860.000.

Freitag, Werner F. J., to SBT Development Corporation. Universal coupling system. 4,080,921, Cl. 114-249.000.

French Oil Mill Machinery Co., The: *See—*
Manko, Nicholas L., 4,080,891, Cl. 100-215.000.

Fricke, Hans-Jurgen; and Bosch, Paul, to Robert Bosch GmbH. Control arrangement for preventing system overload. 4,081,223, Cl. 417-218.000.

Friedman, Leonard: *See—*
Morgan, Thomas E., Jr., 4,081,307, Cl. 156-272.000.

Fries, Bernard A., to Chevron Research Company. Shielded container. 4,081,688, Cl. 250-506.000.

Froggatt, Robert Justin, to EMI Limited. Treatment of absorption errors in computerized tomography. 4,081,681, Cl. 250-360.000.

Frogge, Jerry M. Meter protection circuit. 4,081,854, Cl. 361-104.000.

Fromhein, Olaf: *See—*
Ohlenschlager, Lothar; Fromhein, Olaf; and Rapp, Wilhelm, 4,081,682, Cl. 250-362.000.

Fuchs, Manfred: *See—*
Pfundt, Heimer; Fuchs, Manfred; and Voib, Paul, 4,081,523, Cl. 423-624.000.

Fuchs, Rainer Alois; Hammann, Ingeborg; Behrenz, Wolfgang; and Homeyer, Bernhard, to Bayer Aktiengesellschaft. O-Alkyl-O-[5-chloro-1,2,4-triazol(3)yl]-thiono(thiol)-phosphoric (phosphonic) acid esters and ester-amides. 4,081,535, Cl. 424-200.000.

Fuhr, Karl: *See—*
Traenckner, Hans-Joachim; Fuhr, Karl; Rosenkranz, Hans Jurgen; Patheiger, Manfred, deceased; and Rudolph, Hans, 4,081,492, Cl. 260-837.00R.

Fuhrman, Philip K.; and Greiner, Robert A., Jr., to PPG Industries, Inc. Use of reducing gas curtain for start of glass forming process. 4,081,262, Cl. 65-65.00A.

Fuji Kogyo Co., Ltd.: *See—*
Ohmura, Ryuichi, 4,080,748, Cl. 43-24.000.

Fuji Photo Film Co., Ltd.: *See—*
Kawada, Ken; and Mizutani, Shigemitsu, 4,080,711, Cl. 29-427.000.
Kuboshima, Makoto, 4,081,809, Cl. 354-199.000.

Fuller, John Michael, to L. M. van Moppes & Sons Limited. Drill string stabilizer. 4,081,203, Cl. 308-4.00A.

Furlow, Robert C. Pipe with storage chamber and method of making same. 4,080,972, Cl. 131-180.000.

Furuichi, Minoru: *See—*
Abe, Mitsuo; Murata, Tetsuo; Furuichi, Minoru; Shiraishi, Nobuhide; Wada, Shohei; Tai, Seiji; and Maeda, Tsukasa, 4,081,414, Cl. 260-23.70R.

Futty, Robert C.: *See—*
Kugle, John L.; and Futty, Robert C., 4,081,109, Cl. 222-197.000.

Fuzzell, Joe E.; and Turnquist, Paul E., to Caterpillar Tractor Co. Engine control. 4,080,940, Cl. 123-117.00D.

G & R Industries, Inc.: *See—*
Roller, William G., 4,081,738, Cl. 320-7.000.

Gabriel, Martin G., to Ford Motor Company. Transmission extension oil seal. 4,081,218, Cl. 403-24.000.

Gaetani, Frank J.: *See—*
Yamamoto, Roy I.; Cusano, Carmen M.; and Gaetani, Frank J., 4,081,385, Cl. 252-32.70E.

Gahler, Egon, to Braun Aktiengesellschaft. Circuit for quick charging of batteries. 4,081,739, Cl. 320-32.000.

Gale, Preston Lee, to Caterpillar Tractor Co. Method of deburring intersecting drilled holes. 4,081,655, Cl. 219-121.0LM.

Gall, Ralph J.; and Thompson, Frederick H., to Hooker Chemicals & Plastics Corporation. Process for the reduction of effluent color from a cellulosic pulp bleaching sequence. 4,081,317, Cl. 162-80.000.

Gallagher, Nicholas D.; and Gibbs, Richard L., to Brown-Bridge Mills Inc., The. Apparatus for forming a stripable backing material for pressure-sensitive adhesive carrying substrates. 4,080,878, Cl. 93-58.0ST.

Gallaro, Anthony V.; and Williams, G. Norman, to GTE Sylvania Incorporated. Method of depositing tripartite coating system for a cathode ray tube. 4,080,695, Cl. 29-25.130.

Galli, Luigi, to Fabrica Italiana Lapis ed Affini (Fila) SpA. Pencil sharpener for non-circular section pencils. 4,081,010, Cl. 145-3.100.

Galperin, Alexandr Lvovich: *See—*
Borodin, Valerian Alexeevich; Onikov, Eduard Arshakovich; Sakharov, Boris Alexandrovich; Zabotin, Alexandr Alexandrovich; Loschilin, Evgeny Dmitrievich; and Galperin, Alexandr Lvovich, 4,081,001, Cl. 139-436.000.

Ganguli, Partha S.: *See—*
Hsu, George C.; Gavalas, George R.; Ganguli, Partha S.; and Kalfayan, Sarkis H., 4,081,250, Cl. 44-1.00R.

Gans, Daniel, Jr.; and Noble, John H., to Stone & Webster Engineering Corporation. Subatmospheric double containment system. 4,081,323, Cl. 176-38.000.

Gapoian, Dmitry Trdatovich: *See—*
Repolovsky, Alexandr Ivanovich; Pakhter, Ilya Kharitonovich; Rudakov, Alexei Dmitrievich; Baranov, Alexandr Nikolaevich; Gliner, Leonid Efimovich; Gapoian, Dmitry Trdatovich; and Tumasiants, Igor Veniaminovich, 4,080,875, Cl. 92-29.000.

Gardner, Roland C., to Clevepak Corporation. Resealable container device. 4,081,106, Cl. 220-359.000.

Garnaat, Henry J.: *See—*
Heffron, Allan J.; Garnaat, Henry J.; and Kennedy, Laverne H., 4,080,852, Cl. 82-1.00C.

Garratt, David: *See—*
Siddall, Graham John; and Garratt, David, 4,080,741, Cl. 33-174.00L.

Garrett Corporation, The: *See—*
Wickson, Arthur K., 4,081,853, Cl. 361-104.000.

Gas Developments Corporation: *See—*
Rush, William F.; Wurm, Jaroslav; and Dufour, Raymond J., 4,081,024, Cl. 165-62.000.

Gaspar, Arturo S. Concealed emergency signaling device. 4,081,788, Cl. 340-137.000.

Gatos, Harry C.: *See—*
Platakis, Nicolaos S.; and Gatos, Harry C., 4,080,926, Cl. 118-5.000.

Gatsis, John G.; and Tan, Gim, to UOP Inc. Process for the liquefaction of coal and separation of solids from the liquid product. 4,081,359, Cl. 208-8.000.

Gatsis, John G.: *See—*
Tan, Gim; and Gatsis, John G., 4,081,358, Cl. 208-8.000.
Tan, Gim; and Gatsis, John G., 4,081,360, Cl. 208-8.000.

Gaulin Corporation: *See—*
Rees, Lancelot H., 4,081,863, Cl. 366-176.000.

Gavalas, George R.: *See—*
Hsu, George C.; Gavalas, George R.; Ganguli, Partha S.; and Kalfayan, Sarkis H., 4,081,250, Cl. 44-1.00R.

Gay, Michael John, to Motorola, Inc. Crystal tuned voltage controlled oscillator. 4,081,766, Cl. 331-116.00R.

Geberit AG: *See—*
Stahli, Paul, 4,080,671, Cl. 4-236.000.

Geffon, Arthur P.: *See—*
Price, Robert; Jacoby, George V.; and Geffon, Arthur P., 4,081,756, Cl. 328-117.000.

Geis, Hans Peter: *See—*
Evertz, Herbert; and Geis, Hans Peter, 4,081,187, Cl. 280-701.000.

General Atomic Company: *See—*
Brown, Lloyd C., 4,080,927, Cl. 118-48.000.

General Battery Corporation: *See—*
Eberle, William J., 4,080,732, Cl. 29-730.000.
Eberle, William J., 4,081,093, Cl. 214-314.000.
Nees, John M., 4,081,586, Cl. 429-48.000.

General Dynamics Corporation Electronics Division: *See—*
Moore, Robert Edwin, 4,080,925, Cl. 116-117.00R.

General Electric Company: *See—*
Cline, Harvey E.; and Anthony, Thomas R., 4,081,293, Cl. 148-1.500.
Collins, Clifford B.; and James, William G., 4,081,709, Cl. 313-116.000.
Crivello, James V., 4,081,276, Cl. 96-35.100.
Hatch, Burton D., 4,080,845, Cl. 74-572.000.
Hodnett, Irving E., 4,081,608, Cl. 179-2.00A.
Kemp, Charles L., 4,081,659, Cl. 219-296.000.
Koff, Bernard L.; Budinger, Raymond E.; and Johnson, James E., 4,080,785, Cl. 60-226.00R.
Madden, James A., 4,081,743, Cl. 324-29.500.
Moeller, Richard E., 4,081,410, Cl. 260-2.5AH.
Parks, Harold G.; and Kirkpatrick, Conilee G., 4,081,794, Cl. 365-118.000.
Penney, Carl M.; and Lapp, Marshall, 4,081,215, Cl. 356-45.000.
Prochazka, Svante; and Coblenz, William S., 4,081,284, Cl. 106-44.000.
Rich, Joseph A., 4,081,640, Cl. 200-144.00B.
Smith, Carlyle F., Jr., 4,081,314, Cl. 156-645.000.

General Foods Corporation: *See—*
Hudak, Stephen F.; and Mahlmann, James P., 4,081,563, Cl. 426-428.000.
Meyer, Franklyn Wallace; Pitchon, Esra; and Earle, Ernest Lord, Jr., 4,081,561, Cl. 426-385.000.

General Motors Corporation: *See—*
Meade, Robert A., 4,081,208, Cl. 350-96.200.

General Packaging Corporation: *See—*
Brown, James W., 4,080,906, Cl. 105-489.000.

General Products Company Incorporated: *See—*
McKann, H. Smith, 4,080,813, Cl. 70-450.000.

General Tire & Rubber Company, The: *See—*
van Essen, Willem J.; Shanoski, Henry; and Griffith, Richard M., 4,081,578, Cl. 428-63.000.

Geosource, Inc.: *See—*
Jones, Richard Claiborne; and Whittlesey, John RB, 4,081,828, Cl. 358-75.000.

Gerber Products Company: *See—*
Fogg, Daniel A., 4,080,987, Cl. 137-464.000.

Gergen, William P.; and Davison, Sol, to Shell Oil Company. Multicomponent polyolefin - block copolymer - polymer blends. 4,081,424, Cl. 260-42.180.

Gerzon, Michael Anthony, to National Research Development Corporation. Sound reproduction systems with augmentation of image definition in a selected direction. 4,081,606, Cl. 179-1.0GQ.

Gesellschaft fur Kernforschung m.b.H.: *See—*
Ohlenschlager, Lothar; Fromhein, Olaf; and Rapp, Wilhelm, 4,081,682, Cl. 250-362.000.

Gesellschaft fur Schneidtechnik mit beschrankter Haftung: *See—*
Stolzer, Paul, 4,080,858, Cl. 83-247.000.

Getz, Lynn L.: *See—*
Seifert, Peter; Chupka, David E.; Getz, Lynn L.; Hatton, Derald R.; Thomas, R. Marvin; Osso, John M.; and Rogl, Herbert A., 4,081,147, Cl. 241-261.300.

Geyken, Erwin; and Dawidowitsch, Peter, to AGFA-Gevaert, A.G. Apparatus for processing photographic film and treating contaminated processing liquids. 4,081,816, Cl. 354-324.000.

Gfell, Edward B. Pitch varying apparatus. 4,080,865, Cl. 84-312.00R.

Gibbs, Richard L.: *See—*
Gallagher, Nicholas D.; and Gibbs, Richard L., 4,080,878, Cl. 93-58.0ST.

Gibson, George W.: *See—*
Roscamp, Thomas A.; Gibson, George W.; and Shelley, Pierre Anthony John Minton, 4,081,846, Cl. 360-103.000.

Gibson, Thomas; and Hillis, Roger W., to Foster Wheeler Energy Corporation. Heated enclosures. 4,080,933, Cl. 122-336.000.

Giddings, Brandford E.; Coffey, Gerald P.; Giffen, William M., Jr.; and Mazeke, Herbert F., to Standard Oil Company, The. Process of polymerizing acrylonitrile copolymers employing terpinolene or gamma terpinene as a chain modifier. 4,081,592, Cl. 526-248.000.

Gieske, Harry A. Spiral wrapped shaped charge liners and munition utilizing same. 4,080,898, Cl. 102-24.0HC.

Giffen, William M., Jr.: *See—*
Giddings, Brandford E.; Coffey, Gerald P.; Giffen, William M., Jr.; and Mazeke, Herbert F., 4,081,592, Cl. 526-248.000.

Gilardini S.p.A.: *See—*
De Benedetti, Franco, 4,080,990, Cl. 137-599.100.

Gilbaugh, John W. Animal trap. 4,080,749, Cl. 43-61.000.

Gilbert, Ronald E.: *See—*
Clampitt, Bert H.; and Gilbert, Ronald E., 4,081,587, Cl. 526-54.000.

Gillette, Willard D., to Zephyr Wind Dynamo Company. Method of forming electrical machine care from E-laminations. 4,080,724, Cl. 29-598.000.

Gilmore, Thomas P.: *See—*
Schmidt, Harvey E.; Henry, Luke F.; Murphy, Howard G.; and Gilmore, Thomas P., 4,081,725, Cl. 318-139.000.

Girolami, Antoine. Apparatus and method for measuring the time taken for a change in viscosity to occur. 4,081,242, Cl. 23-230.00R.

Glauser, Wilbert Gordon; and Dilg, Walter Cabble, to Dresser Industries, Inc. Automatic subway coupler. 4,081,083, Cl. 213-76.000.

Gleckler, George C.: *See—*
Casey, Donald J.; and Gleckler, George C., 4,080,969, Cl. 128-335.500.

Glentworth Manufacturing Inc.: *See—*
Calhoun, Albert J., 4,080,846, Cl. 74-615.000.

Glickman, Leslie N., to American Cyanamid Company. Extrudate cutting device. 4,081,230, Cl. 425-192.00R.

Glikman, Mark Leonovich; Tjurin, Jury Mikhailovich; Gorshkov, Gennady Nikolaevich; Gorokhovsky, Vladilen Alexandrovich; Shabanov, Alexei Georgievich; Sapunar, Zakhar Isaevich; Avrus, Albert Vladimirovich; and Fainberg, Evgeny Borisovich. Process for making sheet glass on a fluid support. 4,081,260, Cl. 65-25.00A.

Gliner, Leonid Efimovich: *See—*
Repolovsky, Alexandr Ivanovich; Pakhter, Ilya Kharitonovich; Rudakov, Alexei Dmitrievich; Baranov, Alexandr Nikolaevich; Gliner, Leonid Efimovich; Gapoian, Dmitry Trdatovich; and Tumasiants, Igor Veniaminovich, 4,080,875, Cl. 92-29.000.

Glynn, Paul Anthony: *See—*
Jeffery, Maurice Stanley; Glynn, Paul Anthony; and Khan, Mohammed Moiz Uddin, 4,081,559, Cl. 426-103.000.

Goans, Ronald E.; Cantrell, John H., Jr.; Meyers, F. Bradford; and Stambaugh, Harry D., to United States of America, Energy. Ultrasonic technique for characterizing skin burns. 4,080,960, Cl. 128-2.00V.

Goddard, Terrence P.; Webb, Samuel D.; and Thatcher, Donald N., to Teledyne McCormick Selph. High speed igniter device. 4,080,902, Cl. 102-70.00R.

Goegelman, Robert T.: *See—*
Kahan, Jean S.; Kahan, Frederick M.; Stapley, Edward O.; Goegelman, Robert T.; and Hernandez, Sebastian, 4,081,548, Cl. 424-274.000.

Goell, James E.; Bickel, Gary W.; Kao, Charles K.; and Maklad, Mokhtar S., to International Telephone and Telegraph Corporation. Method for using on line optic fiber loss monitor. 4,081,258, Cl. 65-2.000.

Goettsch, Reijer: *See—*
Wassen, Willem J.; and Goettsch, Reijer, 4,081,442, Cl. 260-239.30A.

Goffe, Charles A., deceased (by Goffe, Patricia Anne, executrix); Heseltine, Donald W.; and Bernard, Robert E., to Eastman Kodak Company. Photothermographic materials containing radiation sensitive quinone compounds and nitrobenzylidene dyes. 4,081,279, Cl. 96-48.0HD.

Goffe, Patricia Anne, executrix: *See—*
Goffe, Charles A., deceased; Heseltine, Donald W.; and Bernard, Robert E., 4,081,279, Cl. 96-48.0HD.

Goffe, William L., to Xerox Corporation. Migration imaging method. 4,081,273, Cl. 96-1.0PS.

Goldsamt, Alan B.; and Greenberg, Earl. Electronic calculator for feet-inch-fraction numerics. 4,081,859, Cl. 364-709.000.

Goldstein, Norman A.: *See—*
Mottola, Elia A.; East, George H., Jr.; Goldstein, Norman A.; Huang, Wu-Cheng; Peech, John M.; Pirotin, Shelden D.; Roemer, Robert E.; and Spada, Albert J., 4,080,998, Cl. 138-107.000.

Golodaev, Boris Glebovich: *See—*
Shraiber, David Solomonovich; Golodaev, Boris Glebovich; Zakharov, Leonid Mikhailovich; and Razumovsky, Anatoly Fedorovich, 4,080,839, Cl. 73-617.000.

Golovoy, Amos, to Ford Motor Company. Method of breaking an oil-in-water emulsion. 4,081,338, Cl. 204-149.000.

Golser, Hans; and Kindl, Helmut, to Siemens Aktiengesellschaft. Gas laser with a laser capillary positioned in a discharge tube. 4,081,762, Cl. 331-94.50G.

Goltsos, Costas E., to Teckton, Inc. Device for microwave cooking. 4,081,646, Cl. 219-10.55E.

Goodman, David Joel; Johnston, James David; and Noll, A. Michael, to Bell Telephone Laboratories, Incorporated. Sidetone control circuit for a telephone set. 4,081,620, Cl. 179-81.00A.

Goodyear Tire & Rubber Company, The: *See—*
Appleby, Paul E.; Brinkley, Max D.; and Smith, Clement C., 4,081,017, Cl. 157-13.000.
Herman, Eugene T., 4,081,013, Cl. 152-179.000.

Goppelt, Dieter: *See—*
Bauer, Rudolf; Goppelt, Dieter; Kruger, Hans-Christian; and Pfitscher, Max, 4,081,204, Cl. 308-216.000.

Gorin, Everett, to Continental Oil Company. Regeneration of zinc halide catalyst used in the hydrocracking of polynuclear hydrocarbons. 4,081,400, Cl. 252-415.000.

Gorokhovsky, Vladilen Alexandrovich: *See—*
Glikman, Mark Leonovich; Tjurin, Jury Mikhailovich; Gorshkov, Gennady Nikolaevich; Gorokhovsky, Vladilen Alexandrovich; Shabanov, Alexei Georgievich; Sapunar, Zakhar Isaevich; Avrus, Albert Vladimirovich; and Fainberg, Evgeny Borisovich, 4,081,260, Cl. 65-25.00A.

Gorshkov, Gennady Nikolaevich: *See—*
Glikman, Mark Leonovich; Tjurin, Jury Mikhailovich; Gorshkov, Gennady Nikolaevich; Gorokhovsky, Vladilen Alexandrovich; Shabanov, Alexei Georgievich; Sapunar, Zakhar Isaevich; Avrus, Albert Vladimirovich; and Fainberg, Evgeny Borisovich, 4,081,260, Cl. 65-25.00A.

Gortsema, Frank P.: *See—*
Hawkins, Albert W.; O'Hara, Matthew J.; Gortsema, Frank P.; and Hedaya, Eddie, 4,081,574, Cl. 427-237.000.

Goto, Yoshiaki, to Okuma Machinery Works, Ltd. Numerically controlled lathe. 4,080,853, Cl. 82-2.00R.

Gotoda, Katsuhiko: *See—*
Nishihama, Hitoshi; Gotoda, Katsuhiko; Motomura, Minoru; Nakajima, Takanobu; and Aizawa, Tatsuo, 4,081,571, Cl. 427-18.000.

Gotz, Hans, to Daimler-Benz Aktiengesellschaft. Motor vehicles with stepped rear sections. 4,081,195, Cl. 296-1.00S.

Graff, Albert J., to United States of America, Air Force. Break-away outrigger. 4,081,177, Cl. 256-12.000.

Granberg, Mauritz L.; Hanson, David G.; and Rajala, Robert L., to Sperry Rand Corporation. Character generation system for a visual display terminal. 4,081,799, Cl. 340-324.0AD.

Grapha-Holding AG: *See—*
Muller, Hans, 4,080,678, Cl. 11-1.0AD.

Gray, Thomas J.; Wojtowicz, Jan; and Baker, Max, to Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence. Flexible lead chloride cathode construction. 4,081,005, Cl. 141-32.000.

Grayson, Martin, to American Cyanamid Company. Mineral beneficiation by froth flotation: use of alcohol ethoxylate partial esters of polycarboxylic acids. 4,081,363, Cl. 209-166.000.

Gre, Michel, to Sodetal-Societe Pour le Developpement du fil Metallique. Machine for drawing metal wire. 4,080,818, Cl. 72-278.000.

Green, Aaron F. Speed control. 4,081,727, Cl. 318-230.000.

Greenberg, Earl: *See—*
Goldsamt, Alan B.; and Greenberg, Earl, 4,081,859, Cl. 364-709.000.

Greene, Richard M.: *See—*
Hirt, Ernie R.; Mensch, William, Jr.; and Greene, Richard M., 4,081,699, Cl. 307-270.000.

Greenhaugh, Earl Elwood: *See—*
Pruder, Gary David; and Greenhaugh, Earl Elwood, 4,080,930, Cl. 119-4.000.

Greer Hydraulics, Inc.: *See—*
Zahid, Abduz, 4,080,996, Cl. 138-30.000.

Gregg, Richard, to Procter & Gamble Company, The. Coffee blend comprising ground-roasted and roasted-ground coffee beans. 4,081,569, Cl. 426-595.000.

Gregory, C. Albert; and Gregory, R. Lane. Fertilizer distributor attachment for a transplanter. 4,080,911, Cl. 111-36.000.

Gregory, R. Lane: *See—*
Gregory, C. Albert; and Gregory, R. Lane, 4,080,911, Cl. 111-36.000.

Greiner, Robert A., Jr.: *See—*
Fuhrman, Philip K.; and Greiner, Robert A., Jr., 4,081,262, Cl. 65-65.00A.

Grier, William R.: *See—*
Gubelmann, William S., deceased; Gubelmann, Walter S., executor; and Grier, William R., 4,081,070, Cl. 197-113.000.

Grierson, W. Doug: *See—*
Richardson, Bruce E.; Oetliker, Rudy; and Grierson, W. Doug, 4,081,078, Cl. 209-82.000.

Griffin, William R.: *See—*
White, Billy H.; and Griffin, William R., 4,081,115, Cl. 224-5.00E.

Griffith, George L., to IMC Chemical Group, Inc. Aqueous explosive slurrie with inorganic peroxide sensitizer. 4,081,299, Cl. 149-41.000.

Griffith, Richard M.: *See—*
van Essen, Willem J.; Shanoski, Henry; and Griffith, Richard M., 4,081,578, Cl. 428-63.000.

Griset, Ernest J., Jr., to Akzona Incorporated. Novelty yarns. 4,080,777, Cl. 57-140.00J.

Groeiz, Jay C., to Heinzman Engineering, Inc., (Entire). Control valve and speed adjustment for water drive irrigation system. 4,080,991, Cl. 137-624.130.

Groeschel, Charles R. Electrostatic expression encoding apparatus for percussive keyboard instruments. 4,080,863, Cl. 84-1.270.

Gross, Michael G.: *See—*
Wenrick, Brian A.; and Gross, Michael G., 4,081,504, Cl. 264-174.000.

Gruber, Leo: *See—*
Ender, Gunter; Schultz, Helmut; Thiele, Hartmut; Gruber, Leo; Kober, Heinrich; Bottcher, Werner; and Macheiner, Tibor, 4,081,151, Cl. 242-68.500.

Gruber, Wilhelm; and Schroeder, Guenter, to Rohm GmbH. Method for the oxidative dehydrogenation of isobutyric acid. 4,081,465, Cl. 260-526.00N.

Grubner, Klaus; Kunze, Werner; and Marckwardt, Werner, to Jenoptik Jena G.m.b.H. Automatic photogrammetric stereo plotter. 4,081,690, Cl. 250-558.000.

Gruhier, Henri; Deschamps, Andre; and Renault, Philippe, to Institut Francais du Petrole. Catalytic conversion of an ammonium sulfate to sulfur dioxide and ammonia. 4,081,515, Cl. 423-351.000.

Grumman Aerospace Corporation: *See—*
Edelstein, Fred; Haslett, Robert A.; and Sangesland, Odd E., 4,081,023, Cl. 165-53.000.

Gruodis, Algirdas Joseph: *See—*
Balyoz, John; Gruodis, Algirdas Joseph; Jen, Teh-Sen; and Mikhail, Wadie Faltas, 4,080,720, Cl. 29-577.00C.

Grylls, Frederick S. M.; Rennie, Stanley D.; and Kelly, Michael, to Distillers Company (Yeast) Limited, The. Processes and apparatus for producing active dried yeast. 4,081,558, Cl. 426-62.000.

Gscheidmeier. Manfred; and Hacker, Karl, to Hoechst Aktiengesellschaft. Process for the manufacture of light color terpenephenols. 4,081,425, Cl. 260-62.000.

GTE Sylvania Incorporated: *See—*
Gallaro, Anthony V.; and Williams, G. Norman, 4,080,695, Cl. 29-25.130.
Klein, Arthur H., 4,081,835, Cl. 358-165.000.
Wheeler, Robert C., 4,081,838, Cl. 358-169.000.

Gubelmann, Walter S., executor: *See—*
Gubelmann, William S., deceased; Gubelmann, Walter S., executor; and Grier, William R., 4,081,070, Cl. 197-113.000.

Gubelmann, William S., deceased; by Gubelmann, Walter S., executor; and Grier, William R., to Realty & Industrial Corporation. Underlining device for justifying text writing reproducing machine. 4,081,070, Cl. 197-113.000.

Gubertini, Giampaolo: *See—*
Bovo, Amilcare; Gubertini, Giampaolo; Musumeci, Luigi; and Valbonesi, Giuseppe, 4,081,611, Cl. 179-15.0AT.

Gudelis, David A.: *See—*
West, Theodore H.; Eagen, John F.; and Gudelis, David A., 4,081,352, Cl. 208-36.000.

Guinn, David C.; Haggard, Archie K.; and Thomas, John P. Casing handling system. 4,081,084, Cl. 214-1.00P.

Guinn, David C.; Haggard, Archie K.; and Thomas, John P. Blow out preventer handling system. 4,081,163, Cl. 248-2.000.

Gulf Oil Corporation: *See—*
Clampitt, Bert H.; and Gilbert, Ronald E., 4,081,587, Cl. 526-54.000.

Gulf Research & Development Company: *See—*
Hildebrand, Richard E.; Montagna, Angelo A.; and Paraskos, John A., 4,081,361, Cl. 208-10.000.
Kehl, William L.; and Montagna, Angelo A., 4,081,353, Cl. 208-216.000.

Gulf & Western Manufacturing Company: *See—*
Hook, Bernard K.; Heniser, Richard J.; and Miller, Stanley J., 4,080,819, Cl. 72-347.000.

Gullotti, Damian V.: *See—*
Chatfield, Phillip A.; and Gullotti, Damian V., 4,080,702, Cl. 29-157.30V.

Gundlach, Robert W., to Xerox Corporation. Selective tack imaging and printing. 4,080,897, Cl. 101-467.000.

Gupta, Laxmi C.: *See—*
Wyman, Ransome J.; and Gupta, Laxmi C., 4,081,429, Cl. 260-77.5AB.

Gyurkocza, Csaba: *See—*
Csom, Gyula; Desi, Sandor; Szolnay, Eva; Gyurkocza, Csaba; Szucs, Imre; Varbiro, Vilmos; Elo, Sandor; and Benedek, Sandor, 4,081,683, Cl. 250-364.000.

Haber, George J., to International Flavors & Fragrances Inc. Dry dessert mix composition. 4,081,566, Cl. 426-578.000.

Haber, George J., to International Flavors & Fragrances Inc. Dry beverage mix composition. 4,081,567, Cl. 426-580.000.

Hacker, Karl: *See—*
Gscheidmeier, Manfred; and Hacker, Karl, 4,081,425, Cl. 260-62.000.

Haennerle A.G.: *See—*
Haenni, Eduard A., 4,081,085, Cl. 214-1.600.

Haenni, Eduard A., to Haennerle A.G. Apparatus for raising and feeding flat workpieces from a stack. 4,081,085, Cl. 214-1.600.

Haferl, Peter Eduard, to RCA Corporation. Conduction overlap control circuit for switched output stages. 4,081,721, Cl. 315-389.000.

Haferl, Peter Eduard, to RCA Corporation. Signal processor for switched vertical deflection system. 4,081,722, Cl. 315-393.000.

Hafner, Emanuel R., to Hasler AG. Method for building-up of routing addresses in a digital telecommunication network. 4,081,612, Cl. 179-15.0BA.

Hagberg, Calvin Andre: *See—*
Javes, Wallace Raymond; Hagberg, Calvin Andre; and Anderson, Harold Coulston, 4,081,645, Cl. 219-10.55B.

Hagen, Magnus F. Structural support mounting means for precision, telescoping, linear slide mechanisms. 4,080,686, Cl. 16-88.000.

Hager, Richard A.: *See—*
Moore, Thomas W.; Hager, Richard A.; and Clarkson, Robert J., 4,080,694, Cl. 28-170.000.

Haggard, Archie K.: *See—*
Guinn, David C.; Haggard, Archie K.; and Thomas, John P., 4,081,084, Cl. 214-1.00P.
Guinn, David C.; Haggard, Archie K.; and Thomas, John P., 4,081,163, Cl. 248-2.000.

Hagiawara, Yoshiaki: *See—*
Ochi, Shigeyuki; and Hagiawara, Yoshiaki, 4,081,841, Cl. 358-213.000.

Hahn, Gunter: *See—*
Bohme, Dietrich; Schumann, Gunter Hellmut; Hahn, Gunter; and Jung, Rolf, 4,081,671, Cl. 250-202.000.

Haldex Aktiebolag: *See—*
Ahlberg, Erik Jan Krister, 4,081,663, Cl. 364-467.000.

Hale, Richard A.: *See—*
Hennessey, Richard G.; Hale, Richard A.; and Kestian, Anthony M., 4,081,050, Cl. 180-64.00R.

Haley, Ernest K. Web centerline locating system. 4,080,740, Cl. 33-174.00L.

Hall, David Y., to Indian Head, Inc. Carton wall with reinforcing rib. 4,081,124, Cl. 229-23.0BT.

Hall, Dennis Sidney, to USM Corporation. Cementing machine for edge folding or binding. 4,081,311, Cl. 156-475.000.

Hall, John B.; Sprecker, Mark A.; Schmitt, Frederick Louis; and Vock, Manfred Hugo, to International Flavors & Fragrances Inc. Substituted-1-acetyl-3,3-dimethylcyclohexane. 4,081,479, Cl. 260-586.00R.

Hall, John B.; Sprecker, Mark A.; Vock, Manfred Hugo; Shuster, Edward J.; Vinals, Joaquin; and Novak, Robert M., to International Flavors & Fragrances Inc. 1-(2-Methyl-2-propenyl)-3-(4-methyl-3-pentenyl)-Δ^2-cyclohexene-1-carboxaldehyde and 1-(2-methyl-2-propenyl)-4-(4-methyl-3-pentenyl)-Δ^1-cyclohexene-1-carboxaldehyde. 4,081,483, Cl. 260-598.000.

Hall, John B.: *See—*
Sprecker, Mark A.; Vock, Manfred Hugo; Schmitt, Frederick Louis; Hall, John B.; and Sanders, James Milton, 4,081,481, Cl. 260-586.00R.

Hall, Leo M., to University of Alabama, The Board of Trustees of the. A method for removing maltotetraose and lower saccharides from solution. 4,081,326, Cl. 195-7.000.

Hamashima, Yoshio: *See—*
Nagata, Wataru; Narisada, Masayuki; Hamashima, Yoshio; and Okada, Kyoto, 4,081,595, Cl. 544-23.000.

Hamatani, Fumikazu; Ichikawa, Mikihiro; and Tanaka, Yuji, to Nippon Tsu Shin Kogyo K.K.; and TIE/Communications, Inc. Control circuitry for key telephone apparatus. 4,081,625, Cl. 179-99.000.

Hamburg, Glenn; and Jasas, Gytis, to Teledyne Industries, Inc. Turbine engine lubrication system. 4,080,783, Cl. 60-39.080.

Hamilton, William F., II. Touch control switch circuit with compensation for power supply line fluctuations. 4,081,700, Cl. 307-308.000.

Hammann, Ingeborg: *See—*
Fuchs, Rainer Alois; Hammann, Ingeborg; Behrenz, Wolfgang; and Homeyer, Bernhard, 4,081,535, Cl. 424-200.000.

Hammarqvist, Bo Georg, to AB Norbergs Mekaniska Verkstad. Arrangement for handling and preparation of base plates and the like such as, for example, casting molds. 4,081,089, Cl. 214-38.0CC.

Hammond, James Woodrow; and Shughart, Mervin Leonard, to AMP Incorporated. Apparatus for singling out and serially feeding electrical leads. 4,080,731, Cl. 29-715.000.

Hanold, R. C. Frederick, III, to Union Carbide Corporation. Low temperature sintering ceramic capacitor and method of making. 4,081,857, Cl. 361-321.000.

Hansen, Charles W.: *See—*
Madsen, Elmer W.; and Hansen, Charles W., 4,081,703, Cl. 310-49.00R.

Hansen, Frode Johan: *See—*
Nastasic, Vladimir; Hansen, Frode Johan; Watson, Donald Miller; and Manton, David William, 4,080,916, Cl. 114-65.00R.

Hanson, Bruce L.: *See—*
Bregman, David; Hanson, Bruce L.; and Wolvek, Sidney, 4,080,958, Cl. 128-1.00D.

Hanson, David G.: *See—*
Granberg, Mauritz L.; Hanson, David G.; and Rajala, Robert L., 4,081,799, Cl. 340-324.0AD.

Hara, Hisashi, to Tokyo Shibaura Electric Co., Ltd. Semiconductor device. 4,081,817, Cl. 357-23.000.

Harbaugh, Steven K.; and Amtower, Richard E., to Eocom Corporation. Facsimile system. 4,081,842, Cl. 358-256.000.

Hardenfelt, Jarl, to Jarl Hardenfelt Material Development Centre. Spreading or coating composition. 4,081,423, Cl. 260-40.00R.

Harderup, Ernst Einar. Protective and levelling device for distributor machines. 4,081,142, Cl. 239-687.000.

Hardinge Brothers, Inc.: *See—*
Peterson, Anders Adolf, 4,080,854, Cl. 82-36.00R.

Hari, Stefan; and Ronco, Karl, to Ciba-Geigy Corporation. Aromatic disazo pigments. 4,081,439, Cl. 260-176.000.

Harrington, John Sherman: *See—*
Parrillo, Henry; Harrington, John Sherman; and Curtis, Glenn Howard, 4,080,692, Cl. 26-91.000.

Harris, Raymond, to United S. C. F., Inc. Rail scale. 4,081,045, Cl. 177-163.000.

Harris, Thomas C. Weighing hopper and method. 4,081,004, Cl. 141-10.000.

Harrison Leather Goods Corporation: *See—*
Tucker, Deborah E., 4,081,061, Cl. 190-52.000.

Hartl, Walter; Eggelsmann, Harry; and Hodum, Claus-Peter, to U.S. Philips Corporation. X-ray rotating-anode tube with a magnetic bearing. 4,081,707, Cl. 313-60.000.

Hartley, Ezra Dale, to Carr-Griff, Inc. Pressure switch with diaphragm and valve means. 4,081,621, Cl. 200-83.00Q.

Hartman, Marvis E.: *See—*
Christenson, Roger M.; Bosso, Joseph F.; Hartman, Marvis E.; and Chang, Wen-Hsuan, 4,081,341, Cl. 204-181.00C.

Hartmann, James R.: *See—*
Vassos, Louis J.; Heinz, John W.; and Hartmann, James R., 4,081,704, Cl. 310-50.000.

Harvey, Robert T.: *See—*
Schrag, Robert L.; Long, Harold A.; and Harvey, Robert T., 4,081,067, Cl. 197-1.00R.

Hasbrouck, Thad M., to United Technologies Corporation. Gate valve fabricated from pipe. 4,081,175, Cl. 251-327.000.

Hase, Takashi; Kagami, Akiyasu; Mimura, Yoshiyuki; Narita, Kinichiro; and Hiraki, Minoru, to Dai Nippon Toryo Co., Ltd. Fluorescent compositions. 4,081,398, Cl. 252-301.40R.

Hashimoto, Hiromi: *See—*
Yamamoto, Masami; Yamazaki, Fumiaki; Hosoda, Akira; Hashimoto, Hiromi; and Tan, Yoichi, 4,081,790, Cl. 340-146.1BE.

Hashimoto, Shinichiro: *See—*
Kitawaki, Nobuhiko; and Hashimoto, Shinichiro, 4,081,605, Cl. 179-1.0SC.

Hashimoto, Shintaro: *See—*
Washizuka, Isamu; and Hashimoto, Shintaro, 4,081,664, Cl. 364-705.000.

Hashimoto, Shunichi; Kirino, Osamu; Ozaki, Toshiaki; and Yamashita, Norihisa, to Sumitomo Chemical Company, Limited. Pyridyltriazinone herbicidal compositions. 4,081,267, Cl. 71-93.000.

Hasler AG: *See—*
Hafner, Emanuel R., 4,081,612, Cl. 179-15.0BA.

Haslett, Robert A.: *See—*
Edelstein, Fred; Haslett, Robert A.; and Sangesland, Odd E., 4,081,023, Cl. 165-53.000.

Hassan, Javathu Kutikaran; and Paivanas, John Angelo, to International Business Machines Corporation. Wafer air film transportation system. 4,081,201, Cl. 302-2.00R.

Hatch, Burton D., to General Electric Company. Shaped disc flywheel. 4,080,845, Cl. 74-572.000.

Hattler, Louis R.: *See—*
Bar-on, Ari; and Hattler, Louis R., 4,081,213, Cl. 355-3.0FU.

Hatton, Derald R.: *See—*
Seifert, Peter; Chupka, David E.; Getz, Lynn L.; Hatton, Derald R.; Thomas, R. Marvin; Osso, John M.; and Rogl, Herbert A., 4,081,147, Cl. 241-261.300.

Hauck, Frederic P.: *See—*
Condon, Michael E.; Hauck, Frederic P.; and Reid, Joyce, 4,081,444, Cl. 260-268.0PH.

Hawker, Fred D.: *See—*
Berenschot, Donald J.; Anders, Dale F.; and Hawker, Fred D., 4,081,416, Cl. 260-29.4UA.
Hawkins, Albert W.; O'Hara, Matthew J.; Gortsema, Frank P.; and Hedaya, Eddie, to Union Carbide Corporation. Multichamber vapor deposition process. 4,081,574, Cl. 427-237.000.
Hawkins, Royal R.: *See—*
Bulger, Frederick J.; Hawkins, Royal R.; and Kuntz, Leland E., 4,081,033, Cl. 172-4.500.
Hayashi, Shizuo: *See—*
Asakawa, Toshiro; Ishida, Atsuo; and Hayashi, Shizuo, 4,081,526, Cl. 424-57.000.
Hayashi, Takao: *See—*
Shimizu, Akihiko; and Hayashi, Takao, 4,081,419, Cl. 260-29.6HN.
Hayter, John C.: *See—*
Smith, Grant H.; and Hayter, John C., 4,081,064, Cl. 192-70.130.
Hazard, Robert E., to Polytop Corporation. Child resistant dispensing closure. 4,081,113, Cl. 222-534.000.
Hazard, Robert E.: *See—*
Wilson, Woodrow S.; and Hazard, Robert E., 4,081,108, Cl. 222-153.000.
Heaney, James J., to Anthony's Manufacturing Company, Inc. Insulated refrigerator door frame. 4,080,756, Cl. 49-70.000.
Heath Company: *See—*
Olson, John Emery, 4,081,797, Cl. 340-324.0AD.
Hedaya, Eddie: *See—*
Hawkins, Albert W.; O'Hara, Matthew J.; Gortsema, Frank P.; and Hedaya, Eddie, 4,081,574, Cl. 427-237.000.
Hedden, Walter A.: *See—*
Lankard, David R.; and Hedden, Walter A., 4,081,283, Cl. 106-38.300.
Hedman, Curtis P.: *See—*
Ravis, James C.; and Hedman, Curtis P., 4,081,785, Cl. 340-5.00R.
Heffron, Allan J.; Garnaat, Henry J.; and Kennedy, Laverne H., to CM Systems, Inc.; and Crankshaft Machine Co. Method and apparatus for machining crankshafts. 4,080,852, Cl. 82-1.00C.
Heiba, El Ahmadi I.; and Dessau, Ralph M., to Mobil Oil Corporation. Bis-lactam derivatives. 4,081,456, Cl. 260-326.250.
Heidemann, Gerrit: *See—*
Bulters, Hein; Heidemann, Gerrit; and de Putter, Warner Jan, 4,080,999, Cl. 138-125.000.
Heier, Wilbur C.; and Lucy, Melvin H., to United States of America, National Aeronautics and Space Administration. Molded composite pyrogen igniter for rocket motors. 4,080,901, Cl. 102-49.700.
Heilman, Marlin S.; and Waddell, Seid W., to Medrad, Inc. Method of manufacturing catheter guidewire. 4,080,706, Cl. 29-173.000.
Hein, Allyn J., to Caterpillar Tractor Co. Combined summing and underspeed valve. 4,080,979, Cl. 137-118.000.
Hein, Richard William, to B. F. Goodrich Company, The. Extractive distillation of C_5 hydrocarbons using acetonitrile and additives. 4,081,332, Cl. 203-51.000.
Heinemann, Heinz, to Mobil Oil Corporation. Conversion of coal into motor fuel. 4,081,351, Cl. 208-8.000.
Heinsohn, Howard H., Jr.: *See—*
Evers, William J.; Heinsohn, Howard H., Jr.; and Vock, Manfred Hugo, 4,081,480, Cl. 260-586.00M.
Heinz, John W.: *See—*
Vassos, Louis J.; Heinz, John W.; and Hartmann, James R., 4,081,704, Cl. 310-50.000.
Heinzle, Otto. Vertically flaring concrete form. 4,081,167, Cl. 249-10.000.
Heinzman Engineering, Inc., (Entire): *See—*
Groelz, Jay C., 4,080,991, Cl. 137-624.130.
Heller, Fritz Peter; and Ellis, Stafford Malcolm, to Elliott Brothers (London) Limited. Headgear with spherical semi-reflecting surface. 4,081,209, Cl. 350-174.000.
Hemala, Zdenek; Nudinger, Gunter; Wehrmeister, Gerhard; Mair, Reinhard; and Wurster, Erich, to Saurer-Allma GmbH Allgauer Maschinenbau. Threading device for double twist thread twisting frames. 4,080,776, Cl. 57-34.00R.
Henderson, Cyril, to American Safety Equipment Corporation. Dual tension retractor. 4,081,152, Cl. 242-107.000.
Hendricks, William E. Automatic torque sensor. 4,081,048, Cl. 180-33.00D.
Hendrickson, Melvin Carlyle, to Zenith Radio Corporation. 82 Detent manual varactor tuning system. 4,081,771, Cl. 334-15.000.
Hendrie, John Matthew: *See—*
Rhind, Terence Keith; Andrews, Allen Howe; Burdine, Warren Emil; and Hendrie, John Matthew, 4,081,780, Cl. 338-164.000.
Heniser, Richard J.: *See—*
Hook, Bernard K.; Heniser, Richard J.; and Miller, Stanley J., 4,080,819, Cl. 72-347.000.
Hennessey, Richard G.; Hale, Richard A.; and Kestian, Anthony M., to International Harvester Company. Front engine tractor having transverse midship mounted heat exchanger. 4,081,050, Cl. 180-64.00R.
Henry, Luke F.: *See—*
Schmidt, Harvey E.; Henry, Luke F.; Murphy, Howard G.; and Gilmore, Thomas P., 4,081,725, Cl. 318-139.000.
Hensel, Jorg; Koberstein, Edgar; and Lakatos, Eduard, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Process for producing an adherent metal oxide coating on a solid body. 4,081,576, Cl. 427-385.00C.
Henson, William P., to Mobile Drilling Company, Inc. Method and apparatus for thin-walled tube sampling of soils. 4,081,040, Cl. 175-58.000.
Herman, Eugene T., to Goodyear Tire & Rubber Company, The. Traction shoe seal. 4,081,013, Cl. 152-179.000.
Hermans, Johny C., to s.a. Texaco Belgium n.v. Certain bispiperazido phosphorus compounds. 4,081,445, Cl. 260-268.00K.
Hernandez, Sebastian: *See—*
Kahan, Jean S.; Kahan, Frederick M.; Stapley, Edward O.; Goegelman, Robert T.; and Hernandez, Sebastian, 4,081,548, Cl. 424-274.000.
Herr, John F.: *See—*
Rogers, Philip A.; and Herr, John F., 4,081,303, Cl. 156-192.000.
Herr, Ronald P.; and Maurin, Kenneth W., to Ken-Herr & Associates. Antenna coupler with automatically switched dummy load. 4,081,750, Cl. 325-150.000.
Herrington, F. John, to Mobil Oil Corporation. Flow distribution valve for dual thermoplastic tube extrusion. 4,081,231, Cl. 425-464.000.
Hertogh, Joannes Petrus: *See—*
Mossel, Anthonius Clemens; and Hertogh, Joannes Petrus, 4,081,714, Cl. 313-493.000.
Heseltine, Donald W.: *See—*
Goffe, Charles A., deceased; Heseltine, Donald W.; and Bernard, Robert E., 4,081,279, Cl. 96-48.0HD.
Hess, Stephen Walter, to Hessco Industries, Inc. Molded bathtub fixture and method of manufacturing the same. 4,080,710, Cl. 29-416.000.
Hessco Industries, Inc.: *See—*
Hess, Stephen Walter, 4,080,710, Cl. 29-416.000.
Hester, Jackson B., Jr., to Upjohn Company, The. Novel derivatives of 4H-s-triazolo[4,3-α][1,4]benzodiazepines. 4,081,452, Cl. 260-296.00T.
Heyl & Patterson, Inc.: *See—*
Lofink, Gerard V.; and Vozniak, Carl J., 4,080,904, Cl. 104-162.000.
Heywood, Alan Edward; and Hutchings, Robert Michael, to Johnson, Matthey & Co., Limited. Platinum-coated igniters. 4,081,710, Cl. 313-141.000.
Higaki, Taiji: *See—*
Akiyama, Toyomi; Higaki, Taiji; Shiratsuchi, Eiichiro; and Tagami, Eijiro, 4,081,583, Cl. 428-457.000.
Akiyama, Toyomi; Higaki, Taiji; Shiratsuchi, Eiichiro; and Tagami, Eijiro, 4,081,584, Cl. 428-514.000.
Hikosaka, Noboru; and Yanagawa, Isamu, to Isuzu Motors Limited. Structure of V type internal combustion engine. 4,080,945, Cl. 123-195.00C.
Hildebrand, Richard E.; Montagna, Angelo A.; and Paraskos, John A., to Gulf Research & Development Company. Process for the conversion of carbonaceous materials. 4,081,361, Cl. 208-10.000.
Hildreth, Bradrick Alan; Stephens, Donald Harrison; and Wiley, George Richard, to Bourns, Inc. Combined rotary potentiometer and switch. 4,081,782, Cl. 338-200.000.
Hillenbrand, Bernhard: *See—*
Martens, Hans; and Hillenbrand, Bernhard, 4,081,573, Cl. 427-62.000.
Hillis, Roger W.: *See—*
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Himmele, Walter: *See—*
Hoffmann, Werner; Himmele, Walter; Paust, Joachim; Von Fraunberg, Karl; Siegel, Hardo; and Pfohl, Sigberg, 4,081,477, Cl. 260-563.00P.
Himmelsbach, Paul: *See—*
Baab, Albert; and Himmelsbach, Paul, 4,081,811, Cl. 354-272.000.
Hiner, William D.; Hughes, Jimmy E.; and Slaughter, Tommy J. Signal generating flying saucer with thin central vibratile portion. 4,080,753, Cl. 46-227.000.
Hines, Charles E., to Outboard Marine Corporation. Soil aerating device. 4,081,034, Cl. 172-22.000.
Hipwell, William E. H., to Eastman Kodak Company. Apparatus for encoding television signals. 4,081,827, Cl. 358-14.000.
Hirai, Masaaki, to Asahi Kogyo Co., Ltd. Three-stage collapsible umbrella. 4,080,976, Cl. 135-25.00R.
Hiraki, Minoru: *See—*
Hase, Takashi; Kagami, Akiyasu; Mimura, Yoshiyuki; Narita, Kinichiro; and Hiraki, Minoru, 4,081,398, Cl. 252-301.40R.
Hirano, Tokuro: *See—*
Tamura, Hifumi; Ishitani, Tohru; and Hirano, Tokuro, 4,081,674, Cl. 250-251.000.
Hiraoka, Tatsuo: *See—*
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Hirayama, Chikara: *See—*
Melamed, Nathan T.; and Hirayama, Chikara, 4,081,761, Cl. 331-94.50E.
Hirt, Ernie R.; Mensch, William, Jr.; and Greene, Richard M., to MOS Technology, Inc. Depletion mode coupling device for a memory line driving circuit. 4,081,699, Cl. 307-270.000.
Hisamoto, Hironori; Muraki, Katsushi; and Kimura, Motoji, to Matsushita Electric Industrial Co., Ltd. Transformer with heat conducting laminate. 4,081,776, Cl. 336-61.000.
Hishinuma, Yukio; Akimoto, Hidetoshi; Kaji, Ryuichi; Nakajima, Fumito; and Arikawa, Yoshijiro, to Hitachi, Ltd.; and Babcock-Hitachi Kabushiki Kaisha. Method for removing nitrogen oxides from flue gas by absorption. 4,081,509, Cl. 423-235.000.
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Hishinuma, Yukio; Akimoto, Hidetoshi; Kaji, Ryuichi; Nakajima, Fumito; and Arikawa, Yoshijiro, 4,081,509, Cl. 423-235.000.
Ishida, Giichi; and Sunada, Masayoshi, 4,080,914, Cl. 112-277.000.
Kaji, Tetsunori; and Sumioka, Atsushi, 4,081,717, Cl. 315-169.0TV.

Kato, Akira; Matsuda, Shimpei; Uno, Shigeo; Imahashi, Jinichi; and Nakajima, Fumito, 4,081,510, Cl. 423-237.000.
Kuzunuki, Soshiro; Hirasawa, Kotaro; Iwasaka, Tatsuo; and Kaneko, Takashi, 4,081,059, Cl. 187-29.00R.
Misumi, Akira, 4,081,713, Cl. 313-346.00R.
Takamiya, Tadashi; and Yumde, Yasufumi, 4,081,834, Cl. 358-158.000.
Tamura, Hifumi; Ishitani, Tohru; and Hirano, Tokuro, 4,081,674, Cl. 250-251.000.

Hitachi Medical Corporation: *See*—
Kuroda, Masao; Kondo, Toshio; Ono, Sekijyuro; and Ogawa, Toshio, 4,080,838, Cl. 73-612.000.

Hiyoshi, Teruo; Nakada, Akira; Yamada, Shigeru; Ichikawa, Kiyoshi; and Ishii, Shigeki, to Nippon Gakki Seizo Kabushiki Kaisha. Electronic musical instrument having octave slide effect. 4,080,862, Cl. 84-1.240.

Hobson, John S. Combined ice tray egg carton. 4,081,122, Cl. 229-2.5EC.

Hoden, Ebbe Sigfrid; and Eklange, Bo Roland, to Kooperativa Forbundet (KF) Ekonomisk Forening. Method of producing a container and apparatus herefor. 4,080,879, Cl. 93-94.00R.

Hodes, Morrie. Combination tennis racket cover and cap or hat. 4,080,665, Cl. 2-209.100.

Hodnett, Irving E., to General Electric Company. Arrangement for remote control apparatus. 4,081,608, Cl. 179-2.00A.

Hodum, Claus-Peter: *See*—
Hartl, Walter; Eggelsmann, Harry; and Hodum, Claus-Peter, 4,081,707, Cl. 313-60.000.

Hoechst Aktiengesellschaft: *See*—
Gscheidmeier, Manfred; and Hacker, Karl, 4,081,425, Cl. 260-62.000.
Papenfuhs, Theodor, 4,081,446, Cl. 260-281.00N.

Hoehn, Steven Jon, to Litton Business Telephone Systems, Inc. Subset switching means in apparatus for a key telephone system for enabling intercom substations to access trunk lines. 4,081,615, Cl. 179-18.0FA.

Hofer, Donald C.; Kahwaty, Vincent N.; and Valentino, Carl R., to International Business Machines Corporation. Quantitative analysis of nuclear magnetic resonance spectra having solvent peaks. 4,081,742, Cl. 324-.5OA.

Hoffman-La Roche Inc.: *See*—
Schleich, Kuno; and Stoller, Hansjorg, 4,081,470, Cl. 260-410.90R.

Hoffmann-La Roche Inc.: *See*—
Li, Choh Hao, 4,081,434, Cl. 260-112.50R.

Hoffmann, Werner; Himmele, Walter; Paust, Joachim; Von Fraunberg, Karl; Siegel, Hardo; and Pfohl, Sigberg, to BASF Aktiengesellschaft. Pinane derivatives. 4,081,477, Cl. 260-563.00P.

Hoffmann, Werner: *See*—
Baumann, Manfred; and Hoffmann, Werner, 4,081,482, Cl. 260-586.00C.

Hofmeister, Helmut; Wiechert, Rudolf; Annen, Klaus; Laurent, Henry; and Steinbeck, Hermann, to Schering Aktiengesellschaft. Δ^{15}-Steroids and pharmaceutical compositions thereof. 4,081,537, Cl. 424-238.000.

Holdrege, Charles Truman: *See*—
Baker, Stephen Richard; and Holdrege, Charles Truman, 4,081,441, Cl. 260-239.100.

Holec N.V.: *See*—
Brinkman, Willem, 4,080,949, Cl. 123-32.0ST.

Holiman, William E.: *See*—
Johnson, Albert O.; Holiman, William E.; and Buchanan, Stephen D., 4,081,143, Cl. 241-29.000.

Holland, Andrew MacDonald; and Arce, Henry Leyva, to Coast Catamaran Corporation. Sailboat traveler apparatus. 4,080,919, Cl. 114-204.000.

Holloway, Henry, to Ford Motor Company. Method for making and using a group IV–VI semiconductor. 4,080,723, Cl. 29-584.000.

Holm, LeRoy W., to Union Oil Company of California. Enhanced oil recovery using alkaline sodium silicate solutions. 4,081,029, Cl. 166-270.000.

Holmes, David P.: *See*—
Nalbandian, Noubar; Holmes, David P.; and Fletcher, Alan B., 4,080,909, Cl. 110-235.000.

Holmes, William Samuel; Lowe, Edward James; and Brazier, Ernest Reginald, to Albright & Wilson Limited. Method and apparatus for distillation. 4,081,333, Cl. 203-86.000.

Homeyer, Bernhard: *See*—
Fuchs, Rainer Alois; Hammann, Ingeborg; Behrenz, Wolfgang; and Homeyer, Bernhard, 4,081,535, Cl. 424-200.000.

Honda Giken Kogyo Kabushiki Kaisha: *See*—
Ishii, Makoto; Iiyama, Masahiko; and Ozaki, Masaaki, 4,081,499, Cl. 261-39.00E.

Honda, Keisuke. Fish finder capable of discriminating sizes of fish. 4,081,783, Cl. 340-3.00R.

Honel, Hans: *See*—
Michel, Walter; Honel, Hans; and Schon, Manfred, 4,081,426, Cl. 260-67.60R.

Honeywell Inc.: *See*—
Braitberg, Michael F., 4,081,845, Cl. 360-68.000.
Bulger, Frederick J.; Hawkins, Royal R.; and Kuntz, Leland E., 4,081,033, Cl. 172-4.500.
Mueller, Dale A., 4,081,234, Cl. 431-28.000.
Wong, Theodore T. S., 4,081,819, Cl. 357-30.000.

Honeywell Information Systems Inc.: *See*—
Miller, Homer Warner, 4,081,860, Cl. 364-738.000.

Hong, Sun-nan: *See*—
Block, Charles S.; Chen, Michael S.; Noichl, Olaf J.; and Hong, Sun-nan, 4,081,368, Cl. 210-14.000.

Hongu, Masayuki: *See*—
Tada, Masahiro; Sumi, Takao; Hongu, Masayuki; and Ishigaki, Yoshio, 4,081,837, Cl. 358-167.000.

Hook, Bernard K.; Heniser, Richard J.; and Miller, Stanley J., to Gulf & Western Manufacturing Company. Apparatus for making drawn articles. 4,080,819, Cl. 72-347.000.

Hooker Chemicals & Plastics Corporation: *See*—
Gall, Ralph J.; and Thompson, Frederick H., 4,081,317, Cl. 162-80.000.
Tybus, Axel W.; and Fabrizio, Leonard A., 4,081,413, Cl. 260-23.0XA.

Hopkins, David L. Implement transportation train. 4,081,090, Cl. 214-38.00R.

Hora, Charles J.; and Babinsky, Andrew D., to Diamond Shamrock Corporation. Polyamine modified membranes and chlor-alkali electrolysis cells employing same. 4,081,349, Cl. 204-252.000.

Horgan, Anthony M., to Xerox Corporation. Composite layered photoreceptor. 4,081,274, Cl. 96-1.0PC.

Hori, Makoto: *See*—
Kitajima, Soichi; Ishiguro, Toshiyuki; Kanno, Tadao; Yamamoto, Katsuhiko; and Hori, Makoto, 4,081,233, Cl. 431-1.000.

Horisberger, Marc; Sozzi, Tomaso; and Pousaz, Robert, to Societe d'Assistance Technique pour Produits Nestle, S.A. Production of a milkcurdling enzyme. 4,081,330, Cl. 195-66.00R.

Hornak, Leonard P.: *See*—
Shallenberger, John M.; Hornak, Leonard P.; and Desmarchais, Walter E., 4,081,086, Cl. 214-2.000.

Horner, Ellwood J., to American Hoechst Corporation. Pulsed spray of fluids. 4,081,577, Cl. 427-424.000.

Horner, Ellwood J., to American Hoechst Corporation. Apparatus for guiding sheet material into counterrotating brushes. 4,081,815, Cl. 354-319.000.

Horstmann, Harald: *See*—
Moller, Eike; Meng, Karl; Wehinger, Egbert; and Horstmann, Harald, 4,081,596, Cl. 548-367.000.

Hosoda, Akira: *See*—
Yamamoto, Masami; Yamazaki, Fumiaki; Hosoda, Akira; Hashimoto, Hiromi; and Tan, Yoichi, 4,081,790, Cl. 340-146.1BE.

Houdaille Industries, Inc.: *See*—
De George, Robert P.; and Brown, Paul R., 4,080,855, Cl. 83-71.000.

Hough, William Vernon, to Mine Safety Appliances Company. Method for preparing carborane. 4,081,484, Cl. 260-606.50B.

Howard, James J., to Litton Business Systems, Inc. Baud rate generator utilizing single clock source. 4,081,755, Cl. 328-41.000.

Hsu, George C.; Gavalas, George R.; Ganguli, Partha S.; and Kalfayan, Sarkis H., to California Institute of Technology. Coal desulfurization process. 4,081,250, Cl. 44-1.00R.

Huang, Wu-Cheng: *See*—
Mottola, Elia A.; East, George H., Jr.; Goldstein, Norman A.; Huang, Wu-Cheng; Peech, John M.; Pirotin, Shelden D.; Roemer, Robert E.; and Spada, Albert J., 4,080,998, Cl. 138-107.000.

Hubbard, S. Eugene, to Kawneer Company, Inc. Window safety system. 4,080,758, Cl. 49-390.000.

Hubble, Bill R.; Siegel, Stanley; and Cunningham, Paul T., to United States of America, Energy. Regeneration of sulfated metal oxides and carbonates. 4,081,522, Cl. 423-542.000.

Huber, Bernard, to Bodenseewerk Perkin-Elmer & Co., GmbH. Device for automatically supplying liquid samples to analytical instruments. 4,080,833, Cl. 73-423.00A.

Huchette, Michel: *See*—
Louveaux, Jean-Louis; LeJolly nee Vereecque, Danielle; and Huchette, Michel, 4,081,556, Cl. 426-2.000.

Hucklesby, John Charles; Lilley, Raymond Arthur; and Jackson, Ronald Henry, to Baker Perkins Chemical Machinery Limited. Mixing machine. 4,081,862, Cl. 366-99.000.

Hudak, Stephen F.; and Mahlmann, James P., to General Foods Corporation. Decaffeination of green coffee. 4,081,563, Cl. 426-428.000.

Hughes, Jimmy E.: *See*—
Hiner, William D.; Hughes, Jimmy E.; and Slaughter, Tommy J., 4,080,753, Cl. 46-227.000.

Hulls, John Robin; and Donofrio, David Michael, to Bio-Kinetics Inc. Purification of waste water high in carbohydrates and simultaneous production of high protein feed product. 4,081,367, Cl. 210-11.000.

Humboldt Products Corporation: *See*—
DePriest, Donald R.; Brandon, Bobby C.; and Buie, Connell M., 4,081,306, Cl. 156-250.000.

Hung, Roland Y., to International Business Machines Corporation. Fabrication of semiconductor device. 4,080,721, Cl. 29-578.000.

Hunsucker, Jerry Hoyt, to IMC Chemical Group, Inc. Water-dispersed coating composition of short oil alkyd resin and alkanolamine. 4,081,411, Cl. 260-22.00R.

Hunter, Edwin J., to Toro Company, The. Backflow preventing valve construction. 4,080,980, Cl. 137-218.000.

Hutchings, Robert Michael: *See*—
Heywood, Alan Edward; and Hutchings, Robert Michael, 4,081,710, Cl. 313-141.000.

Hutchison, Stanley O.; and Anderson, Glenn W., to Chevron Research Company. Steam deflector for use in a well. 4,081,032, Cl. 166-317.000.

Huwels, Wilhelm: *See*—
Preusser, Gerhard; Schulze, Martin; Richter, Klaus; and Huwels, Wilhelm, 4,081,355, Cl. 208-313.000.

Ichikawa, Kiyoshi: *See*—
Hiyoshi, Teruo; Nakada, Akira; Yamada, Shigeru; Ichikawa, Kiyoshi; and Ishii, Shigeki, 4,080,862, Cl. 84-1.240.
Ichikawa, Mikihiro: *See*—
Hamatani, Fumikazu; Ichikawa, Mikihiro; and Tanaka, Yuji, 4,081,625, Cl. 179-99.000.
Idemitsu Petrochemical Co., Ltd.: *See*—
Tokumitsu, Ichiro; Konuma, Hideo; Mochizuki, Shigeaki; Okada, Yoshio; Yasumoto, Hiroshi; and Yoshihiro, Isao, 4,081,497, Cl. 260-880.00R.
Ideskar, Willie Ake, to Saab-Scania Aktiebolag. Protection device for arms of ejection seat occupant. 4,081,156, Cl. 244-122.0AG.
Iiams, George A., to PPG Industries, Inc. Tongs for gripping thin glass sheets. 4,081,193, Cl. 294-118.000.
Iiyama, Masahiko: *See*—
Ishii, Makoto; Iiyama, Masahiko; and Ozaki, Masaaki, 4,081,499, Cl. 261-39.00E.
Iizuka, Haruhiko, to Nissan Motor Company, Limited. Apparatus and method for controlling ignition of multi-cylinder internal combustion engines with a passageway that bypasses throttle valve. 4,080,947, Cl. 123-198.00F.
Ikoma, Kiyoshi: *See*—
Onishi, Masanori; Yoshikawa, Tadashi; Ikoma, Kiyoshi; and Nakakohara, Tetsuya, 4,081,849, Cl. 360-137.000.
Imahashi, Issei. Apparatus for driving dotting hammers of a matrix printer. 4,080,892, Cl. 101-93.040.
Imahashi, Jinichi: *See*—
Kato, Akira; Matsuda, Shimpei; Uno, Shigeo; Imahashi, Jinichi; and Nakajima, Fumito, 4,081,510, Cl. 423-237.000.
IMC Chemical Group, Inc.: *See*—
Griffith, George L., 4,081,299, Cl. 149-41.000.
Hunsucker, Jerry Hoyt, 4,081,411, Cl. 260-22.00R.
Immer, Hans U.; Nelson, Verner R.; and Sestanj, Kazimir, to Ayerst, McKenna & Harrison Limited. Extended chain derivatives of somatostatin. 4,081,530, Cl. 424-177.000.
Imperial Chemical Industries Limited: *See*—
Baird, David Boyd; Fischwick, Brian Ribbons; Campbell, James Stanley; and Smith, Peter, 4,081,435, Cl. 260-156.000.
Doroszkowski, Andrew; and Nicks, Peter Francis, 4,081,412, Cl. 260-22.0CQ.
Evans, Dennis Ernest Mackley; and Robson, Edwin, 4,081,588, Cl. 526-87.000.
Fleming, Ian George Cameron; and Jones, Raymond Vincent Heavon, 4,081,597, Cl. 548-363.000.
Thompson, Ronald Austin, 4,081,428, Cl. 260-75.00N.
Indian Head, Inc.: *See*—
Hall, David Y., 4,081,124, Cl. 229-23.0BT.
Industrie-Werke Karlsruhe Augsburg Aktiengesellschaft: *See*—
Miller, Harry, 4,081,149, Cl. 242-18.0PW.
Industriele Onderneming Wavin N.V.: *See*—
Bulters, Hein; Heidemann, Gerrit; and de Putter, Warner Jan, 4,080,999, Cl. 138-125.000.
Industriewerk Schaeffler OHG: *See*—
Bauer, Rudolf; Goppelt, Dieter; Kruger, Hans-Christian; and Pfitscher, Max, 4,081,204, Cl. 308-216.000.
Inoue, Mitio, to TDK Electronics Company, Limited. Magnetic supporter assembly. 4,081,114, Cl. 224-5.00C.
Inoue, Shigeru: *See*—
Ono, Hiroshi; and Inoue, Shigeru, 4,081,469, Cl. 260-555.00A.
Institut Francais du Petrole: *See*—
Gruhier, Henri; Deschamps, Andre; and Renault, Philippe, 4,081,515, Cl. 423-351.000.
Institut National de la Recherche Agronomique: *See*—
Louveaux, Jean-Louis; LeJolly nee Vereecque, Danielle; and Huchette, Michel, 4,081,556, Cl. 426-2.000.
Institute for Industrial Research and Standards: *See*—
O'Sullivan, James C.; McAvoy, Patrick J.; and Jeffery, Glynn B., 4,080,806, Cl. 66-64.000.
International Business Machines Corporation: *See*—
Balyoz, John; Gruodis, Algirdas Joseph; Jen, Teh-Sen; and Mikhail, Wadie Faltas, 4,080,720, Cl. 29-577.00C.
Devore, Ernest William; and McDowell, Judson Allen, 4,081,844, Cl. 360-48.000.
Hassan, Javathu Kutikaran; and Paivanas, John Angelo, 4,081,201, Cl. 302-2.00R.
Hofer, Donald C.; Kahwaty, Vincent N.; and Valentino, Carl R., 4,081,742, Cl. 324-.50A.
Hung, Roland Y., 4,080,721, Cl. 29-578.000.
Koopman, Nicholas George; and Totta, Paul Anthony, 4,081,825, Cl. 357-81.000.
International Flavors & Fragrances Inc.: *See*—
Chhuy, Lim Chheang; and Day, Edgar Allen, deceased, 4,081,565, Cl. 426-533.000.
Evers, William J.; Heinsohn, Howard H., Jr.; and Vock, Manfred Hugo, 4,081,480, Cl. 260-586.00M.
Haber, George J., 4,081,566, Cl. 426-578.000.
Haber, George J., 4,081,567, Cl. 426-580.000.
Hall, John B.; Sprecker, Mark A.; Schmitt, Frederick Louis; and Vock, Manfred Hugo, 4,081,479, Cl. 260-586.00R.
Hall, John B.; Sprecker, Mark A.; Vock, Manfred Hugo; Shuster, Edward J.; Vinals, Joaquin; and Novak, Robert M., 4,081,483, Cl. 260-598.000.
Sprecker, Mark A.; Vock, Manfred Hugo; Schmitt, Frederick Louis; Hall, John B.; and Sanders, James Milton, 4,081,481, Cl. 260-586.00R.
International Harvester Company: *See*—
Hennessey, Richard G.; Hale, Richard A.; and Kestian, Anthony M., 4,081,050, Cl. 180-64.00R.
International Minerals & Chemical Corporation: *See*—
Roberts, Hugh Hill; and West, Gary R., 4,080,831, Cl. 73-421.00A.
International Mobile Machines Corporation: *See*—
Bolgiano, Duane Ridgely, 4,081,130, Cl. 235-92.0PB.
International Standard Electric Corporation: *See*—
Nitzsche, Klaus, 4,081,773, Cl. 335-213.000.
International Telephone and Telegraph Corporation: *See*—
Annable, Richard V., 4,080,802, Cl. 62-514.0JT.
Cook, Charles R., Jr., 4,081,823, Cl. 357-47.000.
Dempsey, Richard C., 4,081,803, Cl. 343-795.000.
Goell, James E.; Bickel, Gary W.; Kao, Charles K.; and Maklad, Mokhtar S., 4,081,258, Cl. 65-2.000.
Reines, Jose; Platt, Eric Gordon; White, Stanley Earl; Mahood, Robert John; and Corrado, Joseph Michael, 4,081,613, Cl. 179-18.00J.
van der Veer, Rutgerus Antonius, 4,081,235, Cl. 431-54.000.
Inverni Della Beffa S.P.A.: *See*—
Crippa, Felice, 4,081,529, Cl. 424-80.000.
IPCO Hospital Supply Corporation Whaledent International Division: *See*—
Kennedy, Leland T., 4,080,736, Cl. 32-2.000.
IRL Daffin Associates, Inc.: *See*—
Kugle, John L.; and Futty, Robert C., 4,081,109, Cl. 222-197.000.
Irving, Donald W.: *See*—
Chamberlin, Donald W.; and Irving, Donald W., 4,081,362, Cl. 209-74.00R.
Ise Electronics Corporation: *See*—
Uemura, Sashiro, 4,081,715, Cl. 315-13.00R.
Uemura, Sashiro, 4,081,716, Cl. 313-63.000.
Ishida, Atsuo: *See*—
Asakawa, Toshiro; Ishida, Atsuo; and Hayashi, Shizuo, 4,081,526, Cl. 424-57.000.
Ishida, Giichi; and Sunada, Masayoshi, to Hitachi, Ltd. Sewing machine with improved non-ravel seaming controller. 4,080,914, Cl. 112-277.000.
Ishigaki Shokuhin, Inc.: *See*—
Ishigaki, Takayoshi, 4,081,560, Cl. 426-115.000.
Ishigaki, Takayoshi, to Ishigaki Shokuhin, Inc. Instant milk-containing coffee. 4,081,560, Cl. 426-115.000.
Ishigaki, Yoshio: *See*—
Tada, Masahiro; Sumi, Takao; Hongu, Masayuki; and Ishigaki, Yoshio, 4,081,837, Cl. 358-167.000.
Ishigur, Isao: *See*—
Suzuki, Shuichi; Aizawa, Masuo; Ishigur, Isao; Shinohara, Rikio; and Nagamura, Yoichi, 4,081,334, Cl. 204-1.00T.
Ishiguro, Toshiyuki: *See*—
Kitajima, Soichi; Ishiguro, Toshiyuki; Kanno, Tadao; Yamamoto, Katsuhiko; and Hori, Makoto, 4,081,233, Cl. 431-1.000.
Ishii, Makoto; Iiyama, Masahiko; and Ozaki, Masaaki, to Honda Giken Kogyo Kabushiki Kaisha. Carburetor with electric heating type autochoke device. 4,081,499, Cl. 261-39.00E.
Ishii, Shigeki: *See*—
Hiyoshi, Teruo; Nakada, Akira; Yamada, Shigeru; Ichikawa, Kiyoshi; and Ishii, Shigeki, 4,080,862, Cl. 84-1.240.
Ishitani, Tohru: *See*—
Tamura, Hifumi; Ishitani, Tohru; and Hirano, Tokuro, 4,081,674, Cl. 250-251.000.
Isuzu Motors Limited: *See*—
Hikosaka, Noboru; and Yanagawa, Isamu, 4,080,945, Cl. 123-195.00C.
Itani, Hikaru: *See*—
Uyeo, Shoichiro; Itani, Hikaru; Aoki, Tsutomu; Tsuji, Teruji; and Nagata, Wataru, 4,081,443, Cl. 260-239.100.
Ito, Fumio: *See*—
Kawamura, Masaharu; Sakurada, Nobuaki; Ito, Tadashi; Murakami, Hiroyashu; Ito, Fumio; and Shinoda, Nobuhiko, 4,081,813, Cl. 354-289.000.
Ito, Tadashi: *See*—
Kawamura, Masaharu; Sakurada, Nobuaki; Ito, Tadashi; Murakami, Hiroyashu; Ito, Fumio; and Shinoda, Nobuhiko, 4,081,813, Cl. 354-289.000.
Itzler, Daniel. Plumbing device. 4,081,190, Cl. 285-226.000.
IVAC Corporation: *See*—
O'Leary, Stephen H., 4,080,967, Cl. 128-214.00F.
Iwai, Sakuya: *See*—
Matubara, Saburo; and Iwai, Sakuya, 4,081,415, Cl. 260-28.5AV.
Iwasaka, Tatsuo: *See*—
Kuzunuki, Soshiro; Hirasawa, Kotaro; Iwasaka, Tatsuo; and Kaneko, Takashi, 4,081,059, Cl. 187-29.00R.
J. I. Case Company: *See*—
Bowen, Victor Ross, 4,081,035, Cl. 172-484.000.
J. & J. Marquardt, Firma: *See*—
Schaffeler, Alois, 4,081,632, Cl. 200-6.0BB.
J. M. Ney Company, The: *See*—
Kulig, Frank M., 4,081,019, Cl. 164-34.000.
J. M. Voith GmbH: *See*—
Wolf, Jakob; and Lasschuit, Iwan, 4,081,321, Cl. 162-346.000.
Jaccoud, Pierre, to Von Roll AG. Process for cooling the flue gases in waste material incineration plants without heat utilization. 4,080,910, Cl. 110-210.000.
Jackson, David H. Pedal actuated pitch-changing means for a stringed instrument. 4,080,864, Cl. 84-312.00P.

Jackson, Joseph N. Programmable television receiver controllers. 4,081,754, Cl. 325-396.000.

Jackson, Ronald Henry: *See—*
Hucklesby, John Charles; Lilley, Raymond Arthur; and Jackson, Ronald Henry, 4,081,862, Cl. 366-99.000.

Jacobsen, Hans C. L.: *See—*
Olrik, Hans H.; and Jacobsen, Hans C. L., 4,080,681, Cl. 14-1.000.

Jacoby, George V.: *See—*
Price, Robert; Jacoby, George V.; and Geffon, Arthur P., 4,081,756, Cl. 328-117.000.

Jacquelin, Jean, to Compagnie Generale d'Electricite S.A. Forced flow electrochemical battery. 4,081,585, Cl. 429-23.000.

James, William G.: *See—*
Collins, Clifford B.; and James, William G., 4,081,709, Cl. 313-116.000.

Janatka, Vladimir; and Dolan, James J., to ValJim Corporation. Direct-current electrical heat-treatment of continuous metal sheets in a protective atmosphere. 4,081,296, Cl. 148-16.000.

Janicke, Johann; and Marendaz, Georges-Andre, to Ateliers des Charmilles, S.A. Electrical discharge machining by means of a wire electrode. 4,081,652, Cl. 219-69.00W.

Jansen, Richard F.: *See—*
Birum, Gail H.; and Jansen, Richard F., 4,081,463, Cl. 260-502.40R.

Jantsch, Ottomar: *See—*
Eckstein, Paul; Jantsch, Ottomar; and Reimann, Bernd, 4,080,830, Cl. 73-719.000.

Jantzen, Steven L.: *See—*
Randolph, Robert W.; and Jantzen, Steven L., 4,081,651, Cl. 219-61.000.

Japan Atomic Energy Research Institute: *See—*
Yoshida, Masaru; and Kaetsu, Isao, 4,081,421, Cl. 260-32.8EP.

Japan Exlan Company Limited: *See—*
Takegami, Shinsuke; Korenaga, Takashi; and Yoshinaga, Chiharu, 4,081,401, Cl. 252-428.000.
Takegami, Shinsuke; Korenaga, Takashi; and Yoshinaga, Chiharu, 4,081,403, Cl. 252-428.000.

Japan Synthetic Rubber Co., Ltd.: *See—*
Abe, Mitsuo; Murata, Tetsuo; Furuichi, Minoru; Shiraishi, Nobuhide; Wada, Shohei; Tai, Seiji; and Maeda, Tsukasa, 4,081,414, Cl. 260-23.70R.
Akiyama, Toyomi; Higaki, Taiji; Shiratsuchi, Eiichiro; and Tagami, Eijiro, 4,081,583, Cl. 428-457.000.
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Hardenfelt, Jarl, 4,081,423, Cl. 260-40.00R.

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Hamburg, Glenn; and Jasas, Gytis, 4,080,783, Cl. 60-39.080.

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Javes, Wallace Raymond; Hagberg, Calvin Andre; and Anderson, Harold Coulston, to Litton Systems, Inc. Temperature controlled microwave oven. 4,081,645, Cl. 219-10.55B.

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Jefferies, Patrick Joseph, to Sterling Drug Inc. Storage stable concentrated aqueous solutions of aminomethylated phthalocyanines. 4,081,239, Cl. 8-1.0XA.

Jefferson, Mark T.: *See—*
Celmer, Walter D.; Cullen, Walter P.; Moppett, Charles E.; Routien, John B.; Jefferson, Mark T.; Shibakawa, Riichiro; and Tone, Junsuke, 4,081,532, Cl. 424-122.000.

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O'Sullivan, James C.; McAvoy, Patrick J.; and Jeffery, Glynn B., 4,080,806, Cl. 66-64.000.

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Jenkins, William A., to Monarch Marking Systems, Inc. Method of making a composite label web. 4,081,309, Cl. 156-250.000.

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Grubner, Klaus; Kunze, Werner; and Marckwardt, Werner, 4,081,690, Cl. 250-558.000.

Jensen, James Wendell: *See—*
Rising, Paul Eugene; Jensen, James Wendell; and Cook, Harold, Jr., 4,081,104, Cl. 220-268.000.

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Jeumont-Schneider: *See—*
Devy, Robert C.; and Salmon, Jean P., 4,081,160, Cl. 246-63.00C.
Dumont, Alain G., 4,081,616, Cl. 179-81.00A.

Jo Paul Industries, Inc.: *See—*
Paulson, John K.; and Steffan, Walter J., 4,080,950, Cl. 124-1.000.

Johansson, Goran Lennart Daniel, to Aktiebolaget Skane-Emballage. Container lid having gripping means. 4,081,098, Cl. 215-329.000.

John Zink Company: *See—*
Reed, Robert D., 4,081,378, Cl. 210-177.000.
Zink, John S.; Reed, Robert D.; and Schwartz, Robert E., 4,080,883, Cl. 98-58.000.

Johns-Manville Corporation: *See—*
Rogers, Philip A.; and Herr, John F., 4,081,303, Cl. 156-192.000.

Johnsen, Arne: *See—*
Polhall, Karl-Olof Adolf; and Johnsen, Arne, 4,080,859, Cl. 83-306.000.

Johnson, Albert O.; Holiman, William E.; and Buchanan, Stephen D., to Tire-Gator, Inc. Methods of handling waste. 4,081,143, Cl. 241-29.000.

Johnson Controls, Inc.: *See—*
Rice, Paul Patrick, 4,081,636, Cl. 200-83.00Y.

Johnson, Gary R.; and Kammerer, Archer W., Jr., to Tri-State Oil Tool Industries, Inc. Stabilizer and rotary expansible drill bit apparatus. 4,081,042, Cl. 175-267.000.

Johnson, George Erick, to CPC International Inc. Filter cake compressor. 4,081,380, Cl. 210-332.000.

Johnson, Gordon W.: *See—*
Bubula, Thomas J.; Franz, Maurice F.; Johnson, Gordon W.; and Rinaldo, James D., 4,080,850, Cl. 74-861.000.

Johnson, James E.: *See—*
Koff, Bernard L.; Budinger, Raymond E.; and Johnson, James E., 4,080,785, Cl. 60-226.00R.

Johnson & Johnson: *See—*
Butterworth, George A. M.; Elias, Robert T.; and Miller, Wayne D., 4,081,582, Cl. 428-284.000.

Johnson, Leonard L., to Teco, Inc. Hydraulic device for controlling the perpendicularity of boom members in mobile platforms. 4,081,055, Cl. 182-2.000.

Johnson, Matthey & Co., Limited: *See—*
Heywood, Alan Edward; and Hutchings, Robert Michael, 4,081,710, Cl. 313-141.000.

Johnson, Ronald M., to P. R. Mallory & Co. Inc. Means limiting end play of a rotor of a synchronous motor. 4,081,705, Cl. 310-90.000.

Johnson, Thomas B.; and Leva, Larry D., to Armco Steel Corporation. Gate valve. 4,081,174, Cl. 251-327.000.

Johnson, W. Grant. Valve for an oral evacuator system. 4,081,176, Cl. 251-342.000.

Johnston, James David: *See—*
Goodman, David Joel; Johnston, James David; and Noll, A. Michael, 4,081,620, Cl. 179-81.00A.

Johnston, James Stewart, to Rosemount Engineering Company Limited. Electric circuits. 4,080,821, Cl. 73-27.00R.

Jones, Charles, to Curtiss-Wright Corporation. Rotary engine with inserts in rotor faces. 4,080,934, Cl. 123-205.000.

Jones, Floyd S. Trash picker. 4,081,192, Cl. 294-61.000.

Jones, James E.: *See—*
Schimmel, Karl F.; Pierce, Percy E.; and Jones, James E., 4,081,343, Cl. 204-181.00C.

Jones, Raymond Vincent Heavon: *See—*
Fleming, Ian George Cameron; and Jones, Raymond Vincent Heavon, 4,081,597, Cl. 548-363.000.

Jones, Richard Claiborne; and Whittlesey, John RB, to Geosource, Inc. Method for halftone reproduction of continuous tone images. 4,081,828, Cl. 358-75.000.

Jonsson, Gregg N., to Thor Power Tool Company. Control system for a multiple spindle machine. 4,081,037, Cl. 173-1.000.

Jos. Schneider & Co., Optische Werke Kreuznach: *See—*
Baab, Albert; and Himmelsbach, Paul, 4,081,811, Cl. 354-272.000.

Jubb, Albert, to Rolls-Royce Limited. Gas turbine engine power plant with a coal burning fluidized bed. 4,080,784, Cl. 60-39.28T.

Juergens, Rainer, to Christensen, Inc. Hydraulic jars for bore hole drilling. 4,081,043, Cl. 175-297.000.

Julian, Renne S.: *See—*
Voss, William B.; and Julian, Renne S., 4,081,768, Cl. 333-9.000.

Jung, Rolf: *See—*
Bohme, Dietrich; Schumann, Gunter Hellmut; Hahn, Gunter; and Jung, Rolf, 4,081,671, Cl. 250-202.000.

Kabushiki Kaisha Daini Seikosha: *See—*
Shimatsu, Hironori, 4,080,696, Cl. 29-25.350.

Kabushiki Kaisha Komatsu Seisakusho: *See—*
Yokoyama, Masao, 4,081,036, Cl. 172-804.000.

K.K. Nippon Coinco: *See—*
Kobayashi, Osamu, 4,080,973, Cl. 133-5.00R.

Kadija, Igor V.; and Woodard, Kenneth E., Jr., to Olin Corporation. Diaphragms for use in the electrolysis of alkali metal chlorides. 4,081,350, Cl. 204-296.000.

Kaetsu, Isao: *See—*
Yoshida, Masaru; and Kaetsu, Isao, 4,081,421, Cl. 260-32.8EP.

Kagami, Akiyasu: *See—*
Hase, Takashi; Kagami, Akiyasu; Mimura, Yoshiyuki; Narita, Kinichiro; and Hiraki, Minoru, 4,081,398, Cl. 252-301.40R.

Kahan, Frederick M.: *See—*
Kahan, Jean S.; Kahan, Frederick M.; Stapley, Edward O.; Goegelman, Robert T.; and Hernandez, Sebastian, 4,081,548, Cl. 424-274.000.

Kahan, Jean S.; Kahan, Frederick M.; Stapley, Edward O.; Goegelman, Robert T.; and Hernandez, Sebastian, to Merck & Co., Inc. Antibiotics. 4,081,548, Cl. 424-274.000.

Kahwaty, Vincent N.: *See—*
Hofer, Donald C.; Kahwaty, Vincent N.; and Valentino, Carl R., 4,081,742, Cl. 324-.50A.

Kaiser, Kenneth L.: *See*—
Stowik, William J.; and Kaiser, Kenneth L., 4,080,764, Cl. 52-173.00R.
Kaji, Ryuichi: *See*—
Hishinuma, Yukio; Akimoto, Hidetoshi; Kaji, Ryuichi; Nakajima, Fumito; and Arikawa, Yoshijiro, 4,081,509, Cl. 423-235.000.
Kaji, Tetsunori; and Sumioka, Atsushi, to Hitachi, Ltd. Zigzag shifting self-transfer type display device. 4,081,717, Cl. 315-169.0TV.
Kakida, Hideto: *See*—
Minami, Shunsuke; Kakida, Hideto; and Nakauchi, Jun, 4,081,430, Cl. 260-78.00S.
Kalfayan, Sarkis H.: *See*—
Hsu, George C.; Gavalas, George R.; Ganguli, Partha S.; and Kalfayan, Sarkis H., 4,081,250, Cl. 44-1.00R.
Kammerer, Archer W., Jr.: *See*—
Johnson, Gary R.; and Kammerer, Archer W., Jr., 4,081,042, Cl. 175-267.000.
Kanaiwa, Kiyoshi, to Canon Kabushiki Kaisha. Superposition recording apparatus. 4,081,604, Cl. 178-30.000.
Kaneda, Isao, to NEC Sylvania Corporation. Discharge lamp lighting device using a backswing booster. 4,081,718, Cl. 315-244.000.
Kaneko, Takashi: *See*—
Kuzunuki, Soshiro; Hirasawa, Kotaro; Iwasaka, Tatsuo; and Kaneko, Takashi, 4,081,059, Cl. 187-29.00R.
Kaneko, Yoshikazu: *See*—
Tsubuko, Kazuo; Kurotori, Tsuneo; Kimura, Taro; Kawanishi, Toshiyuki; and Kaneko, Yoshikazu, 4,081,391, Cl. 252-62.10L.
Kangle, Purushottam J.: *See*—
Datye, Keshav Vinayak; Kangle, Purushottam J.; Milicevic, Branimir; Litzler, Alfred; and Koller, Eugen Johann, 4,081,240, Cl. 8-94.00A.
Kanno, Tadao: *See*—
Kitajima, Soichi; Ishiguro, Toshiyuki; Kanno, Tadao; Yamamoto, Katsuhiko; and Hori, Makoto, 4,081,233, Cl. 431-1.000.
Kanowsky, Vincent C.; and Canas, Raoul, to Allied Upholstery Mfg., Inc. Cushion construction. 4,080,675, Cl. 5-345.00R.
Kantz, Don B., to Ford Motor Company. Separator apparatus for differential high pressure systems of a Stirling engine. 4,080,788, Cl. 60-517.000.
Kanzaki Paper Manufacturing Co., Ltd.: *See*—
Akiyama, Toyomi; Higaki, Taiji; Shiratsuchi, Eiichiro; and Tagami, Eijiro, 4,081,583, Cl. 428-457.000.
Akiyama, Toyomi; Higaki, Taiji; Shiratsuchi, Eiichiro; and Tagami, Eijiro, 4,081,584, Cl. 428-514.000.
Kao, Charles K.: *See*—
Goell, James E.; Bickel, Gary W.; Kao, Charles K.; and Maklad, Mokhtar S., 4,081,258, Cl. 65-2.000.
Kao, James T. F.: *See*—
Lanier, Carroll W.; and Kao, James T. F., 4,081,593, Cl. 536-57.000.
Kao Soap Co., Ltd.: *See*—
Asakawa, Toshiro; Ishida, Atsuo; and Hayashi, Shizuo, 4,081,526, Cl. 424-57.000.
Kazama, Yoshiteru; Suzuki, Yuji; Sumida, Yuzo; Hiraoka, Tatsuo; and Miura, Yasuo, 4,081,493, Cl. 260-859.0PV.
Kappernaros, James P. Torque drive unit. 4,081,062, Cl. 192-56.00R.
Karayannis, Panayotis; and Munzel, Klaus, to Werkzeugmaschinenfabrik Oerlikon-Buhrle AG. Apparatus for generating an electrical ignition current in a fuze of a projectile. 4,080,869, Cl. 89-6.500.
Karwat, Heinz: *See*—
Lassmann, Eberhard; and Karwat, Heinz, 4,081,257, Cl. 62-532.000.
Kato, Akira; Matsuda, Shimpei; Uno, Shigeo; Imahashi, Jinichi; and Nakajima, Fumito, to Hitachi, Ltd. Process for catalytically treating an exhaust gas containing ammonia gas and oxygen gas to reduce said ammonia gas to nitrogen. 4,081,510, Cl. 423-237.000.
Kato, Eiji. Paper wrapper for wrapping refrigerated meat. 4,081,580, Cl. 428-134.000.
Kato, Taketoshi. Display device. 4,080,747, Cl. 40-613.000.
Katz, Klaus; and Bordovsky, Jaromir, to Daimler-Benz Aktiengesellschaft. Pressure medium servo motor, especially for servo steering systems. 4,080,871, Cl. 91-417.00R.
Kaufman, Ric. Shelf fabricated from a single sheet of thermally deformable material. 4,080,907, Cl. 108-59.000.
Kawada, Ken: and Mizutani, Shigemitsu, to Fuji Photo Film Co., Ltd. Method and apparatus for roll packing a film strip. 4,080,711, Cl. 29-427.000.
Kawai, Naoto. Method of compressing a material under high pressure. 4,081,505, Cl. 264-313.000.
Kawamura, Masaharu; Sakurada, Nobuaki; Ito, Tadashi; Murakami, Hiroyashu; Ito, Fumio; and Shinoda, Nobuhiko, to Canon Kabushiki Kaisha. Photographic information setting apparatus for camera. 4,081,813, Cl. 354-289.000.
Kawanishi, Toshiyuki: *See*—
Tsubuko, Kazuo; Kurotori, Tsuneo; Kimura, Taro; Kawanishi, Toshiyuki; and Kaneko, Yoshikazu, 4,081,391, Cl. 252-62.10L.
Kawneer Company, Inc.: *See*—
Hubbard, S. Eugene, 4,080,758, Cl. 49-390.000.
Kazama, Yoshiteru; Suzuki, Yuji; Sumida, Yuzo; Hiraoka, Tatsuo; and Miura, Yasuo, to Kao Soap Co., Ltd. Resin composition having resistance to hydrolysis. 4,081,493, Cl. 260-859.0PV.
KDI Sylvan Pools, Inc.: *See*—
van den Broek, William A., 4,080,670, Cl. 4-172.170.
Keen, Harry J.: *See*—
Thomas, Haydon C.; and Keen, Harry J., 4,081,801, Cl. 340-347.0AD.
Kehl, William L.; and Montagna, Angelo A., to Gulf Research & Development Company. Hydrodesulfurization with a specific alumina-supported catalyst. 4,081,353, Cl. 208-216.000.
Keil, Thompson & Shurtleff: *See*—
Cordes, Claus; and Sterzel, Hans-Josef, 4,081,422, Cl. 260-40.00R.
Keller, Hansjurg, to Cerberus AG. Infrared radiation-burglary detector. 4,081,680, Cl. 250-342.000.
Kelley, Barbara J.: *See*—
Knight, William S.; and Kelley, Barbara J., 4,081,525, Cl. 424-1.000.
Kelly, Michael: *See*—
Grylls, Frederick S. M.; Rennie, Stanley D.; and Kelly, Michael, 4,081,558, Cl. 426-62.000.
Kelly, Robert C., to Upjohn Company, The. Unsaturated bicyclic lactone intermediates for preparing PGC-type compounds. 4,081,594, Cl. 542-429.000.
Kemp, Charles L., to General Electric Company. Coffeemaker with electrical cord strain relief. 4,081,659, Cl. 219-296.000.
Ken-Herr & Associates: *See*—
Herr, Ronald P.; and Maurin, Kenneth W., 4,081,750, Cl. 325-150.000.
Kendall Company, The: *See*—
Merry, Jack D.; and Kolstedt, Mark W., 4,080,963, Cl. 128-132.00D.
Kennedy, Joseph P., to Exxon Research & Engineering Co. Cationic polymerization catalyst. 4,081,590, Cl. 526-185.000.
Kennedy, Laverne H.: *See*—
Heffron, Allan J.; Garnaat, Henry J.; and Kennedy, Laverne H., 4,080,852, Cl. 82-1.00C.
Kennedy, Leland T., to IPCO Hospital Supply Corporation Whaledent International Division. Method and apparatus for forming a dental prosthesis. 4,080,736, Cl. 32-2.000.
Keramidas, Vassilis George, to Bell Telephone Laboratories, Incorporated. Ohmic contact to aluminum-containing compound semiconductors. 4,081,824, Cl. 357-67.000.
Kerman, Stephen E.; and Tsutsumi, Fumio, to Nippon Tsu Shin Kogyo K.K.; and TIE/Communications, Inc. Key telephone intercom line system. 4,081,624, Cl. 179-99.000.
Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung: *See*—
Proplesch, Peter; and Zimmer, Erich, 4,081,506, Cl. 423-41.000.
Zimmermann, Ulrich; Riemann, Friedrich; and Pilwat, Gunter, 4,081,340, Cl. 204-180.00R.
Kerr, Ralph O.; and Strybos, Gabe W., Jr., to Denka Chemical Corporation. Process for the vapor phase oxidation of benzene to maleic anhydrides. 4,081,460, Cl. 260-346.750.
Kerry, John C.: *See*—
Baker, Maurice W.; Kerry, John C.; Kozlik, Antonin; Marshall, John R.; Nichol, Kenneth J.; and Weighton, David M., 4,081,540, Cl. 424-248.510.
Kestian, Anthony M.: *See*—
Hennessey, Richard G.; Hale, Richard A.; and Kestian, Anthony M., 4,081,050, Cl. 180-64.00R.
Keystone International, Inc.: *See*—
Killian, Henry R., 4,080,844, Cl. 74-424.80A.
Khan, Mohammed Moiz Uddin: *See*—
Jeffery, Maurice Stanley; Glynn, Paul Anthony; and Khan, Mohammed Moiz Uddin, 4,081,559, Cl. 426-103.000.
Killian, Henry R., to Keystone International, Inc. Manual control apparatus. 4,080,844, Cl. 74-424.80A.
Kimura, Motoji: *See*—
Hisamoto, Hironori; Muraki, Katsushi; and Kimura, Motoji, 4,081,776, Cl. 336-61.000.
Kimura, Taro: *See*—
Tsubuko, Kazuo; Kurotori, Tsuneo; Kimura, Taro; Kawanishi, Toshiyuki; and Kaneko, Yoshikazu, 4,081,391, Cl. 252-62.10L.
Kindl, Helmut: *See*—
Golser, Hans; and Kindl, Helmut, 4,081,762, Cl. 331-94.50G.
Kine-Tech Corporation: *See*—
Mohaupt, Henry H., 4,081,031, Cl. 166-299.000.
Kirino, Osamu: *See*—
Hashimoto, Shunichi; Kirino, Osamu; Ozaki, Toshiaki; and Yamashita, Norihisa, 4,081,267, Cl. 71-93.000.
Kirkpatrick, Conilee G.: *See*—
Parks, Harold G.; and Kirkpatrick, Conilee G., 4,081,794, Cl. 365-118.000.
Kiselev, Boris Eliseevich: *See*—
Vetrov, Boris Danilovich; Kiselev, Boris Eliseevich; Kostjukovich, Vladimir Ivanovich; Mikhailovsky, Leonid Nikolaevich; Ryabikova, Julia Nikitichna; and Trofimov, Viktor Ivanovich, 4,080,697, Cl. 29-33.00K.
Kitajima, Soichi; Ishiguro, Toshiyuki; Kanno, Tadao; Yamamoto, Katsuhiko; and Hori, Makoto, to Matsushita Electric Industrial Co., Ltd. Combustion device. 4,081,233, Cl. 431-1.000.
Kitawaki, Nobuhiko; and Hashimoto, Shinichiro, to Nippon Telegraph and Telephone Public Corporation. Speech signal fundamental period extractor. 4,081,605, Cl. 179-1.0SC.
Kiwi Coders Corporation: *See*—
McKay, James G., deceased; and McKay, Allen J., executor, 4,080,896, Cl. 101-426.000.
Klaber, Michael C. Foldable pen. 4,081,217, Cl. 401-131.000.
Klar, John; and Lizotte, Robert H., to Cincinnati Milacron-Heald Corporation. Grinding machine. 4,080,759, Cl. 51-165.00R.
Klatskin, Jerome Barnard; and Rosen, Arye, to RCA Corporation. Method of manufacturing semiconductor devices having a copper heat capacitor and/or copper heat sink. 4,080,722, Cl. 29-580.000.
Klein, Arthur H., to GTE Sylvania Incorporated. Blanking circuitry for a television receiver video system. 4,081,835, Cl. 358-165.000.

Klein, Robert. Sump and sump pump cover. 4,080,984, Cl. 137-371.000.
Kleine, Charles A.; and Middleton, Verne L., to Olin Corporation. Hollow article. 4,081,026, Cl. 165-170.000.
Kleiner, Frank: *See—*
Freitag, Dieter; Nouvertne, Werner; and Kleiner, Frank, 4,081,495, Cl. 260-860.000.
Kleinschmidt, Heinz: *See—*
Flaschar, Heinz; Kroll, Peter; Thomassen, Petrus; Kleinschmidt, Heinz; and Preun, Hugo, 4,080,994, Cl. 137-596.130.
Klingenberg, Hans Ulrich. Electronic wrist watch. 4,080,781, Cl. 58-90.00R.
Klingman, Edwin E., III. Recognition system for class II robots. 4,081,669, Cl. 250-199.000.
Knapp, Helmut: *See—*
Schussler, Hans; Wulf, Hans-Jurgen; Rall, Bernhard; and Knapp, Helmut, 4,081,792, Cl. 340-166.00R.
Knight, Roy George, to Scott Bonnar Limited. Mower. 4,080,774, Cl. 56-199.000.
Knight, William S.; and Kelley, Barbara J., to Beckman Instruments, Inc. Radioimmunoassay of plasma steroids. 4,081,525, Cl. 424-1.000.
Knight, William S.: *See—*
Polito, Alan J.; and Knight, William S., 4,081,244, Cl. 23-230.600.
Polito, Alan J.; and Knight, William S., 4,081,246, Cl. 23-230.600.
Knoll International, Inc.: *See—*
Presby, Benedict F., 4,081,100, Cl. 220-22.400.
Knott, Helen H.: *See—*
Knott, Joseph C., 4,080,812, Cl. 70-256.000.
Knott, Joseph C., to Knott, Helen H. Automobile trunk lock. 4,080,812, Cl. 70-256.000.
Kobayashi, Osamu, to K.K. Nippon Coinco. Apparatus for paying out coins of change. 4,080,973, Cl. 133-5.00R.
Kobe Steel, Ltd.: *See—*
Yoshida, Chisato; and Mori, Takasuke, 4,080,715, Cl. 29-527.700.
Kober, Heinrich: *See—*
Ender, Gunter; Schultz, Helmut; Thiele, Hartmut; Gruber, Leo; Kober, Heinrich; Bottcher, Werner; and Macheiner, Tibor, 4,081,151, Cl. 242-68.500.
Koberstein, Edgar: *See—*
Hensel, Jorg; Koberstein, Edgar; and Lakatos, Eduard, 4,081,576, Cl. 427-385.00C.
Koblasz, Arthur J.; Fender, Derek H.; Yasui, Syozo; and Dekker, Cornelis M., to California Institute of Technology. System for computing wiener kernels. 4,081,858, Cl. 364-553.000.
Koehler, Carlton L. Portable diver distress signalling device. 4,080,677, Cl. 9-9.000.
Koehring Company: *See—*
Briggs, Eugene C.; Wellbaum, William C.; and Shaftner, Robert F., 4,081,238, Cl. 432-222.000.
Koff, Bernard L.; Budinger, Raymond E.; and Johnson, James E., to General Electric Company. Modulating bypass variable cycle turbofan engine. 4,080,785, Cl. 60-226.00R.
Koks, Hendrik L. T.: *See—*
Scholten, Joseph J. F.; and Koks, Hendrik L. T., 4,081,516, Cl. 423-387.000.
Kole Enterprises, Inc.: *See—*
Rorex, Robert L., 4,081,080, Cl. 211-55.000.
Koller, Eugen Johann: *See—*
Datye, Keshav Vinayak; Kangle, Purushottam J.; Milicevic, Branimir; Litzler, Alfred; and Koller, Eugen Johann, 4,081,240, Cl. 8-94.00A.
Kolm, Eric A., to Signal Science Systems, Inc. Dual function acoustic switch. 4,081,840, Cl. 358-194.000.
Kolstedt, Mark W.: *See—*
Merry, Jack D.; and Kolstedt, Mark W., 4,080,963, Cl. 128-132.00D.
Kondo, Toshio: *See—*
Kuroda, Masao; Kondo, Toshio; Ono, Sekijyuro; and Ogawa, Toshio, 4,080,838, Cl. 73-612.000.
Konig, Hans-Bodo; Metzger, Karl Georg; and Schrock, Wilfried, to Bayer Aktiengesellschaft. Penicillins and cephalosporins and their production. 4,081,539, Cl. 424-246.000.
Konuma, Hideo: *See—*
Tokumitsu, Ichiro; Konuma, Hideo; Mochizuki, Shigeaki; Okada, Yoshio; Yasumoto, Hiroshi; and Yoshihiro, Isao, 4,081,497, Cl. 260-880.00R.
Koo, Jackson Chik-Yun; and Zaleckas, Vincent Joseph, to Western Electric Co., Inc. Removal of thin films from substrates by laser induced explosion. 4,081,653, Cl. 219-121.0LM.
Kooperativa Forbundet (KF) Ekonomisk Forening: *See—*
Hoden, Ebbe Sigfrid; and Ekiange, Bo Roland, 4,080,879, Cl. 93-94.00R.
Koopman, Nicholas George; and Totta, Paul Anthony, to International Business Machines Corporation. Conduction-cooled circuit package. 4,081,825, Cl. 357-81.000.
Kopperstad, Leif; and Opedal, Halldor, to Elkem-Spigerverket A/S. Apparatus for collection of tapping gases from electric smelting furnaces. 4,081,178, Cl. 266-158.000.
Korenaga, Takashi: *See—*
Takegami, Shinsuke; Korenaga, Takashi; and Yoshinaga, Chiharu, 4,081,401, Cl. 252-428.000.
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Morgan, Charles R.; and Kramm, David E., 4,081,598, Cl. 560-147.000.
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Fex, Hans Jacob; Kristensson, Sten Krister; and Stamvik, Anders Robert, 4,081,461, Cl. 260-397.400.
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Preusser, Gerhard; Schulze, Martin; Richter, Klaus; and Huwels, Wilhelm, 4,081,355, Cl. 208-313.000.
Krupp, Walter H. Apparatus for compressing gas in response to vehicular traffic. 4,081,224, Cl. 417-229.000.
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Kugle, John L.; and Futty, Robert C., to IRL Daffin Associates, Inc. Hammer system for cement meter. 4,081,109, Cl. 222-197.000.
Kuhla, Donald E., to Pfizer Inc. 6-Amino-2,2-dimethyl-3-cyanopenams. 4,081,455, Cl. 260-306.70R.
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Bulger, Frederick J.; Hawkins, Royal R.; and Kuntz, Leland E., 4,081,033, Cl. 172-4.500.
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Kupcikevicius, Vytautas, to Union Carbide Corporation. Cantilevered belted bag loading method. 4,081,096, Cl. 53-35.000.
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Kuroda, Masao; Kondo, Toshio; Ono, Sekijyuro; and Ogawa, Toshio, to Hitachi Medical Corporation. Method and apparatus for controlling ultrasonic waves. 4,080,838, Cl. 73-612.000.
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Valastro, Bartolo; and Stipcevic, Franko, 4,081,610, Cl. 179-15.0AT.
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Laine, Jacques Pierre Georges. Framework assembly for furniture. 4,081,164, Cl. 248-188.300.
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Lane, John Jay, to Dresser Industries, Inc. Oil well swab cup. 4,081,185, Cl. 277-212.00C.
Lange, Daniel J., to P. D. George Company, The. Solventless electrical insulation resins. 4,081,427, Cl. 260-75.00N.
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Sturgess, Philip Alan; and Langley, Keith William, 4,080,876, Cl. 92-29.000.
Lanier, Carroll W.; and Kao, James T. F., to Ethyl Corporation. Process for producing phosphazene fire retardant. 4,081,593, Cl. 536-57.000.
Lankard, David R.; and Hedden, Walter A., to PMCMA Research Group. Plaster molding composition. 4,081,283, Cl. 106-38.300.
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Larsen, Oliver L. Scrap vehicle wheel crusher. 4,080,887, Cl. 100-35.000.
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Lassmann, Eberhard; and Karwat, Heinz, to Linde Aktiengesellschaft. Freeze regeneration of glycol solutions loaded with water. 4,081,257, Cl. 62-532.000.
Laue, Karl Heinrich; Sander, Theo; Sauder, Peter; and Uckert, Gotthard, to Didier Engineering GmbH. Process for removing nitric oxides from processing exhaust gases. 4,081,511, Cl. 423-239.00A.
Laurent, Henry: *See*—
Hofmeister, Helmut; Wiechert, Rudolf; Annen, Klaus; Laurent, Henry; and Steinbeck, Hermann, 4,081,537, Cl. 424-238.000.
Laurent, Maurice, to Rhone Poulenc Textile. Pneumatic feed. 4,080,808, Cl. 66-125.00R.
Lauter, Ida N. Dough frame. 4,081,169, Cl. 249-115.000.
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Lear Siegler, Inc.: *See*—
Crane, Dale Everett, 4,081,117, Cl. 224-39.000.
LeClaire, William. Warning signal device. 4,080,924, Cl. 116-28.00R.
Lee, Hop. Electric plug with retractable ground terminal. 4,081,206, Cl. 339-14.00P.
Lee, Thomas W., to United States of America, Navy. Prioritied photoisolated digital data transmission system. 4,081,787, Cl. 340-147.00R.
Leenhouts, Albert C.; and Singh, Gurdial, to Superior Electric Company, The. Open loop motor stabilization method and circuit. 4,081,736, Cl. 318-696.000.
Leeper, Rory Ann. Battery powered foot warming insole. 4,080,971, Cl. 128-383.000.
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Leliaert, Raymond M., to Wheelabrator-Frye Inc. Surface treatment device including magnetic shot separator. 4,080,760, Cl. 51-425.000.
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Cunningham, Paul B., 4,080,946, Cl. 123-198.0DB.
Lepetic, Vuko M., to Engelhard Minerals & Chemicals Corporation. Froth flotation method for stibnite. 4,081,364, Cl. 209-167.000.
Leroy, Pierre, to Creusot-Loire. Method of protecting tuyeres for upwardly blowing pure oxygen through the bottom of steel converters. 4,081,268, Cl. 75-52.000.
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Le Vasseur, Arnold P., to Possis Corporation. Automatic conveyor system for moving articles successively to a series of work stations. 4,081,072, Cl. 198-394.000.
Leveen, Robert F. Method for detection of tumors of the breast. 4,080,959, Cl. 128-2.00H.
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Levy, Didya D.; and Ronel, Samuel H., to National Patent Development Corporation. Hydrophilic absorbents. 4,081,402, Cl. 252-428.000.
Lewin, Ian; and Small, Edward S., Jr., to Optical Coating Laboratory, Inc. Lighting fixture having Fresnel reflector with high reflection coating thereon. 4,081,667, Cl. 362-296.000.
Li, Choh Hao, to Hoffmann-La Roche Inc. Novel analogs of β-endorphin. 4,081,434, Cl. 260-112.50R.
Li, Norman N. Edison; Cahn, Robert P.; and Shrier, Adam L., to Exxon Research & Engineering Co. Common ion effect to assist LM separation. 4,081,369, Cl. 210-22.00R.
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Liebrenz, Allan L.; O'Keefe, Verne D.; and Soderberg, Richard V., to Champion International Corporation. Glue bond tester. 4,080,825, Cl. 73-150.00A.
Lietar, Christian; and Blanc, Jean-Pierre, to Robert Bosch GmbH. Composite four-element lens system, particularly for use with laser beams. 4,081,210, Cl. 350-223.000.
Light Industrial Design Co., Inc.: *See*—
Martin, Timothy J., Jr.; and Waschke, David C., 4,081,107, Cl. 220-374.000.
Light, William Andrew: *See*—
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Lightner, Harold C.: *See*—
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Lilley, Raymond Arthur: *See*—
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Lind, Charles F., Jr., to Aqueduct, Inc. In-line flow-control valve. 4,080,993, Cl. 137-504.000.
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Linde Aktiengesellschaft: *See*—
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Linear International Corporation: *See*—
Brimer, Claude Morris; and Von Brimer, Joe W., deceased, 4,081,726, Cl. 318-207.00A.
Linn, John Charles, to Texas Instruments Incorporated. Matrixed magnetic bubble memories. 4,081,861, Cl. 365-2.000.
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Blumel, Harald; and Lipp, Paul, 4,081,502, Cl. 264-140.000.
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Liquifry Company Limited: *See*—
Carrington, Jeffery Neville, 4,081,377, Cl. 210-169.000.
Liska, Zbynek, to Adamovske strojirny, narodni podnik. Device for the tripping of printing cylinder into pressure contact. 4,080,895, Cl. 101-218.000.
Littell, Harry E., Jr., to PPG Industries, Inc. Laminated aircraft windshield. 4,081,581, Cl. 428-138.000.
Litton Business Systems, Inc.: *See*—
Howard, James J., 4,081,755, Cl. 328-41.000.
Litton Business Telephone Systems, Inc.: *See*—
Hoehn, Steven Jon, 4,081,615, Cl. 179-18.0FA.
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Javes, Wallace Raymond; Hagberg, Calvin Andre; and Anderson, Harold Coulston, 4,081,645, Cl. 219-10.55B.
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Datye, Keshav Vinayak; Kangle, Purushottam J.; Milicevic, Branimir; Litzler, Alfred; and Koller, Eugen Johann, 4,081,240, Cl. 8-94.00A.
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Locke, Richard M., Jr.: *See*—
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Lofink, Gerard V.; and Vozniak, Carl J., to Heyl & Patterson, Inc. Railway car positioning apparatus. 4,080,904, Cl. 104-162.000.
Logsdon, John S., to Caterpillar Tractor Co. Adjustable support for reversible seat of a dual-purpose vehicle. 4,081,051, Cl. 180-77.00S.
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Lohstroh, Jan, to U.S. Philips Corporation. Device for reading out the charge condition of a phototransistor. 4,081,793, Cl. 340-166.00R.
Loigerot, Jean, to Association pour la Rationalisation et la Mecanisation de l'Exploitation Forestiere (A.R.ME.F.). Machine for cutting down and shaping trees. 4,081,007, Cl. 144-3.00D.
Long, Harold A.: *See*—
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Loschilin, Evgeny Dmitrievich: *See*—
Borodin, Valerian Alexeevich; Onikov, Eduard Arshakovich; Sakharov, Boris Alexandrovich; Zabotin, Alexandr Alexandrovich; Loschilin, Evgeny Dmitrievich; and Galperin, Alexandr Lvovich, 4,081,001, Cl. 139-436.000.
Losehand, Helmut, to Siemens Aktiengesellschaft. Switching arrange-

ment for telecommunication subscriber stations using key-operated selection units. 4,081,619, Cl. 179-90.00K.

Lotte, Andre: *See—*
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Louveaux, Jean-Louis; LeJolly nee Vereecque, Danielle; and Huchette, Michel, to Institut National de la Recherche Agronomique. Product for feeding bees. 4,081,556, Cl. 426-2.000.

Love, Bobby J. C. Timing control apparatus for a combustion engine. 4,080,939, Cl. 123-117.00R.

Lovell, Walter; and Lawrence, Richard. Motorized cart. 4,081,047, Cl. 180-19.00H.

Lovett, Albert Edward, to USM Corporation. Comprehensive pad box. 4,080,679, Cl. 12-38.000.

Lowe, Edward James: *See—*
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Luban, William L. Light reflective shot pellets. 4,080,899, Cl. 102-42.00R.

Lubrizol Corporation, The: *See—*
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Sowerby, Roger L., 4,081,386, Cl. 252-32.70E.

Luckenbach, Edward C., to Exxon Research & Engineering Co. Process for reducing flue gas contaminants from fluid cracking catalyst regenerator. 4,081,508, Cl. 423-210.000.

Lucy, Melvin H.: *See—*
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Lumma, William C., Jr.; and Saari, Walfred S., to Merck & Co., Inc. Piperazinylpyrazines. 4,081,542, Cl. 424-250.000.

Lusby, Elmer Gene, to Stearns Roger Corporation. Multiple position fluid conductor apparatus. 4,080,870, Cl. 91-414.000.

Mabry, Roger J. Bushing service tool. 4,080,707, Cl. 29-263.000.

Macall, Thomas F. Through-the-lens thermometer apparatus. 4,081,678, Cl. 250-330.000.

Macheiner, Tibor: *See—*
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MacKinnon, H. C., to Agrico Chemical Company. Stable fluid suspension fertilizer composition and method for producing same. 4,081,266, Cl. 71-36.000.

MacSpadden, Floyd E.; Schellhase, Frank A.; Strong, Robert L.; and Tieden, Jansey D., to Boeing Company, The. Pneumatic fail-safe sensor system for N/C machine tool. 4,081,734, Cl. 318-645.000.

Maddaloni, Ciro, to Voxson S.p.A. Plug-in radio set, and support therefor. 4,081,751, Cl. 325-312.000.

Madden, James A., to General Electric Company. Cell discharge voltage monitor circuit for cell capacity grading and method for grading. 4,081,743, Cl. 324-29.500.

Madsen, Elmer W.; and Hansen, Charles W., to North American Philips Corporation. Electric motor having toothed pole pieces. 4,081,703, Cl. 310-49.00R.

Maeda, Kazuo: *See—*
Yamamoto, Kousuke; Takenaka, Ahinji; and Maeda, Kazuo, 4,081,521, Cl. 423-515.000.

Maeda, Tsukasa: *See—*
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Maezawa Industrial Incorporated: *See—*
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Maezawa, Keiji, to Maezawa Industrial Incorporated. Sleeve valve. 4,080,982, Cl. 137-219.000.

Magnavox Company, The: *See—*
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Mahood, Robert John: *See—*
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Mair, Reinhard: *See—*
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Malcolm, David George, to Cambrian Engineering Group Limited, The. Sulphur pelletization process. 4,081,500, Cl. 264-9.000.

Malmros, Edward T.; and Swart, Franz J., to Centric Clutch Company. Overload release clutch. 4,081,063, Cl. 192-56.00F.

Malor Manufacturing, Inc.: *See—*
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Manitowoc Company, Inc., The: *See—*
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Manko, Nicholas L., to French Oil Mill Machinery Co., The. Baling press. 4,080,891, Cl. 100-215.000.

Manos, Philip, to Du Pont de Nemours, E. I., and Company. Membrane drying process. 4,080,743, Cl. 34-9.000.

Manos, Philip, to Du Pont de Nemours, E. I., and Company. Gas separation membrane drying with water replacement liquid. 4,080,744, Cl. 34-9.000.

Manton, David William: *See—*
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Maranci, Arutun, to American Cyanamid Company. Lustrous, antisoiling flame retardant acrylic fibers and process therefor. 4,081,498, Cl. 260-898.000.

Marckwardt, Werner: *See—*
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Marechal, Michel: *See—*
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Marendaz, Georges-Andre: *See—*
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Marforio, Nerino, to Rockwell-Rimoldi S.p.A. Workpiece guide for sewing units. 4,080,912, Cl. 112-121.150.

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Marion, Charles P., to Texaco Development Corporation. Production of purified synthesis gas and carbon monoxide. 4,081,253, Cl. 48-197.00R.

Markwitz, Wernhard, to Siemens Aktiengesellschaft. Switching arrangement for correcting the polarity of a data signal transmitted with a recurrent code. 4,081,789, Cl. 340-146.1AQ.

Marquess, Richard Donovan, to Systron-Donner Corporation. Subminiature linear accelerometer. 4,080,835, Cl. 73-517.00B.

Marsh, David R.; and Stark, Leonard E., to Standard Oil Company (Indiana). Iso- or terephthalic acid production in and recovery from benzoic acid-water solvent system. 4,081,464, Cl. 260-524.00R.

Marshall, John R.: *See—*
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Marshall and Williams Company: *See—*
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Marten, Roger: *See—*
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Martens, Hans; and Hillenbrand, Bernhard, to Siemens Aktiengesellschaft. Method for preparing superconductive Nb_3Sn layers on niobium surfaces for high-frequency applications. 4,081,573, Cl. 427-62.000.

Martin, Hubert C., Jr.: *See—*
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Martin, Thomas William: *See—*
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Martin, Timothy J., Jr.; and Waschke, David C., to Light Industrial Design Co., Inc. Venting closure assembly for milk tank or the like. 4,081,107, Cl. 220-374.000.

Maryland Environmental Service: *See—*
Bassin, Morton; and Tseng, Eugene, 4,081,259, Cl. 65-21.000.

Maschinenfabrik Buckau R. Wolf Aktiengesellschaft: *See—*
Buzga, Heinrich, 4,081,382, Cl. 210-414.000.

Mason, Robert Alan. Carrier for use in supporting a canoe or other elongate article on a vehicle roof. 4,081,118, Cl. 224-42.10G.

Massachusetts Institute of Technology: *See—*
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Massey-Ferguson Inc.: *See—*
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Mathais, Henri; and Weiss, Francis, to Produits Chimiques Ugine Kuhlmann. Trioxa-1, 5, 7 spiro [2,5] octanes and their method of preparation. 4,081,459, Cl. 260-340.700.

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Matthews, Fredric A., to Lockheed Corporation. Support and retention mechanism for missiles in launchers. 4,080,868, Cl. 89-1.806.

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Maurin, Kenneth W.: *See*—
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Mayer, Ferdy. Capacitive electric filter. 4,081,770, Cl. 333-79.000.
Mayer, Joseph, to Schering Corporation. Process for preparing 2-halogeno nicotinic acids. 4,081,451, Cl. 260-295.50R.
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McKann, H. Smith, to General Products Company Incorporated. Bolt lock and lockset adapter assembly. 4,080,813, Cl. 70-450.000.
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McNally, Robert T.; Engelman, Karl; and Noordergraaf, Abraham, to University of Pennsylvania, Trustees of the. Automated infusion apparatus for blood pressure control and method. 4,080,966, Cl. 128-214.00E.
McNeilly, Michael A.; Benzing, Walter C.; and Locke, Richard M., Jr., to Applied Materials, Inc. Process for preparing semiconductor wafers with substantially no crystallographic slip. 4,081,313, Cl. 156-610.000.
McNicol, Brian D.; and Short, Richard T., to Shell Oil Company. Method for preparing fuel cell catalysts. 4,081,409, Cl. 252-472.000.
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Van Breemen, Bertram; Miller, Robert A.; and Wells, Roger D., 4,081,804, Cl. 346-75.000.
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Melamed, Nathan T.; and Hirayama, Chikara, to Westinghouse Electric Corporation. Enhanced laser pumping by auxiliary luminescent centers that absorb and transfer normally wasted pump energy to the laser ion. 4,081,761, Cl. 331-94.50E.
Mendelsohn, Lewis Isaac; Durand, Kevin James; and Nesbitt, Ethan Allen, to Allied Chemical Corporation. Heat treatment of iron-nickel-phosphorus-boron glassy metal alloys. 4,081,298, Cl. 148-121.000.
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Merck & Co., Inc.: *See*—
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Kahan, Jean S.; Kahan, Frederick M.; Stapley, Edward O.; Goegelman, Robert T.; and Hernandez, Sebastian, 4,081,548, Cl. 424-274.000.
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Merrill, Richard E.; and Krueger, Theodore H., to Seal Incorporated. Dry transfer image systems with non-light sensitive frangible layer. 4,081,282, Cl. 96-77.000.
Merry, Jack D.; and Kolstedt, Mark W., to Kendall Company, The. Fenestrated drape. 4,080,963, Cl. 128-132.00D.
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Messmore, Robert L. Carrying case. 4,081,119, Cl. 224-46.00R.
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Meyer, Franklyn Wallace; Pitchon, Esra; and Earle, Ernest Lord, Jr., to General Foods Corporation. Partially decaffeinated soluble coffee product and method therefor. 4,081,561, Cl. 426-385.000.
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Michel, Walter; Honel, Hans; and Schon, Manfred, to Cassella Farbwerke Mainkur Aktiengesellschaft. Preparation of aminoplasts. 4,081,426, Cl. 260-67.60R.
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Mick, Peter; and Beck, Donald, to Video Tek, Inc. Universal motion and intrusion detection system. 4,081,830, Cl. 358-105.000.
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Miller, Homer Warner, to Honeywell Information Systems Inc. Current mode 4-bit arithmetic logic unit with parity. 4,081,860, Cl. 364-738.000.
Miller, Michael E.: *See*—
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Miller, Thomas J. Post-operative combination dressing and internal drain tube with external shield and tube connector. 4,080,970, Cl. 128-350.00R.
Miller, Wayne D.: *See—*
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Moe, Walter; Diker, Charles Michael; and Bernstein, Lawrence Allen, to Diker-Moe Associates. Food cutting machine. 4,081,145, Cl. 241-93.000.
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Kehl, William L.; and Montagna, Angelo A., 4,081,353, Cl. 208-216.000.
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Moore, Edward H., to DeLaval Turbine Inc. Electrical switch responsive to a predetermined fluid flow. 4,081,635, Cl. 200-81.90M.
Moore, James E. Apparatus for hot briquetting. 4,081,228, Cl. 425-144.000.
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Moore, Robert Edwin, to General Dynamics Corporation Electronics Division. Portable surface wind indicator. 4,080,925, Cl. 116-117.00R.
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Morgan, Charles R.; and Kramm, David E., to W. R. Grace & Co. Flame retardant mercaptocarboxylic acid esters of halogenated polyols. 4,081,598, Cl. 560-147.000.
Morgan, Norman D.; and Pilz, Bodo, to Clemar Manufacturing Corporation. Self-cleaning filter assembly for solenoid-actuated valves. 4,081,171, Cl. 251-30.000.
Morgan, Thomas E., Jr., to Friedman, Leonard. Process for binding brake linings. 4,081,307, Cl. 156-272.000.
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Morris, Louis; and Morris, Lois Ann. Welder's hood with air filter. 4,080,664, Cl. 2-8.000.
Morrow, James G., Sr.; Pech, David J.; and Borstad, Jay, to Manitowoc Company, Inc., The. Demountable gantry, boom hoist and counterweight. 4,081,081, Cl. 212-49.000.
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Moss, Gerald, to United States of America, America as represented by Administrator U.S. Environmental Protection Agency. Disposal of sulfur oxide pollutant-containing gas. 4,081,513, Cl. 423-244.000.
Mossel, Anthonius Clemens; and Hertogh, Joannes Petrus, to U.S. Philips Corporation. Method of coating the inner wall of a low-pressure mercury vapor discharge lamp with luminescent material. 4,081,714, Cl. 313-493.000.
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Mueller, Dale A., to Honeywell Inc. Limit and control for heavy oil preheating. 4,081,234, Cl. 431-28.000.

Muggli, Juerg; and Specht, Manfred G., to Polaroid Corporation. Electrostatic transducer having narrowed directional characteristic. 4,081,626, Cl. 179-111.00R.
Muller, Hans, to Grapha-Holding AG. Apparatus for attaching sheets to groups of leaves in bookbinding machines. 4,080,678, Cl. 11-1.0AD.
Muller, William C., to Brunswick Corporation. Method of atomizing a liquid, an atomizer tip for use in the method and method of manufacturing the tip. 4,080,700, Cl. 29-157.00C.
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N L Industries, Inc.: *See*—
Finlayson, Claude Malcolm, 4,081,496, Cl. 260-864.000.
Nadler, Murray; and Cahn, Robert P., to Exxon Research & Engineering Co. Fuel cell power generating stations. 4,080,791, Cl. 60-670.000.
Nagamura, Yoichi: *See*—
Suzuki, Shuichi; Aizawa, Masuo; Ishigur, Isao; Shinohara, Rikio; and Nagamura, Yoichi, 4,081,334, Cl. 204-1.00T.
Nagao, Susumu: *See*—
Takiyama, Eiichiro; Sugimoto, Toshiaki; Yamaguchi, Goichi; and Nagao, Susumu, 4,081,591, Cl. 526-217.000.
Nagata, Wataru; Narisada, Masayuki; Hamashima, Yoshio; and Okada, Kyoto, to Shionogi & Co., Ltd. Reduction giving 3-cephem compounds. 4,081,595, Cl. 544-23.000.
Nagata, Wataru: *See*—
Uyeo, Shoichiro; Itani, Hikaru; Aoki, Tsutomu; Tsuji, Teruji; and Nagata, Wataru, 4,081,443, Cl. 260-239.100.
Nagel, Hartmut; and Perkins, Roger, to BBC Brown Boveri & Company Limited. RE-Co-Fe-transition metal permanent magnet and method of making it. 4,081,297, Cl. 148-103.000.
Naidus, Edward Sidney; and Clark, Charles Wheeler, to RCA Corporation. Skylight frame construction. 4,080,763, Cl. 52-200.000.
Nakada, Akira: *See*—
Hiyoshi, Teruo; Nakada, Akira; Yamada, Shigeru; Ichikawa, Kiyoshi; and Ishii, Shigeki, 4,080,862, Cl. 84-1.240.
Nakajima, Fumito: *See*—
Hishinuma, Yukio; Akimoto, Hidetoshi; Kaji, Ryuichi; Nakajima, Fumito; and Arikawa, Yoshijiro, 4,081,509, Cl. 423-235.000.
Kato, Akira; Matsuda, Shimpei; Uno, Shigeo; Imahashi, Jinichi; and Nakajima, Fumito, 4,081,510, Cl. 423-237.000.
Nakajima, Takanobu: *See*—
Nishihama, Hitoshi; Gotoda, Katsuhiko; Motomura, Minoru; Nakajima, Takanobu; and Aizawa, Tatsuo, 4,081,571, Cl. 427-18.000.
Nakakohara, Tetsuya: *See*—
Onishi, Masanori; Yoshikawa, Tadashi; Ikoma, Kiyoshi; and Nakakohara, Tetsuya, 4,081,849, Cl. 360-137.000.
Nakamura, Makoto: *See*—
Shindou, Yoshio; and Nakamura, Makoto, 4,081,344, Cl. 204-181.00R.
Nakano, Takao, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor memory device. 4,081,697, Cl. 365-154.000.
Nakata, Josuke, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor temperature sensitive switching device with short carrier lifetime region. 4,081,818, Cl. 357-28.000.
Nakauchi, Jun: *See*—
Minami, Shunsuke; Kakida, Hideto; and Nakauchi, Jun, 4,081,430, Cl. 260-78.00S.
Nalbandian, Noubar; Holmes, David P.; and Fletcher, Alan B., to Envirometrix, Inc. Pollution free multi-chambered burner. 4,080,909, Cl. 110-235.000.
Nanny, Walter C., to Shell Oil Company. Mechanical pipe end seal-/alignment device. 4,080,799, Cl. 61-110.000.
Narisada, Masayuki: *See*—
Nagata, Wataru; Narisada, Masayuki; Hamashima, Yoshio; and Okada, Kyoto, 4,081,595, Cl. 544-23.000.
Narita, Kinichiro: *See*—
Hase, Takashi; Kagami, Akiyasu; Mimura, Yoshiyuki; Narita, Kinichiro; and Hiraki, Minoru, 4,081,398, Cl. 252-301.40R.
Nartron Corporation: *See*—
Bull, Dale L., 4,081,634, Cl. 200-61.270.
Bull, David W., 4,081,633, Cl. 200-67.0DA.
Nastasic, Vladimir; Hansen, Frode Johan; Watson, Donald Miller; and Manton, David William, to Redpath Dorman Long (North Sea) Limited. Maritime platform assemblies. 4,080,916, Cl. 114-65.00R.
National Patent Development Corporation: *See*—
Levy, Didya D.; and Ronel, Samuel H., 4,081,402, Cl. 252-428.000.
National Research Development Corporation: *See*—
Gerzon, Michael Anthony, 4,081,606, Cl. 179-1.0GQ.
National Starch and Chemical Corporation: *See*—
Skoultchi, Martin M., 4,081,308, Cl. 156-310.000.
National Steel Corporation: *See*—
Stevenson, Robert Van Ness; and Robertson, Courtland L., 4,081,851, Cl. 361-42.000.
Tichauer, Paul Arthur; Adams, James Stephen; and Thokar, Henry Desmont, 4,081,270, Cl. 75-60.000.
Naturin-Werk Becker & Co.: *See*—
Winkler, Bruno, 4,081,562, Cl. 426-390.000.
NCR Corporation: *See*—
Schrag, Robert L.; Long, Harold A.; and Harvey, Robert T., 4,081,067, Cl. 197-1.00R.
NEC Sylvania Corporation: *See*—
Kaneda, Isao, 4,081,718, Cl. 315-244.000.
Nees, John M., to General Battery Corporation. Disposable battery package for charged and dumped batteries. 4,081,586, Cl. 429-48.000.
Neimanns, Nikolaus; and Krupka, Manfred, to Siemens Aktiengesellschaft. Method for manufacturing an electrical heating device. 4,080,726, Cl. 29-611.000.
Nelbock-Hochstetter, Michael: *See*—
Jaworek, Dieter; Botsch, Karl-Heinz; Weimann, Gunter; Nelbock-Hochstetter, Michael; and Determann, Helmut, 4,081,329, Cl. 195-63.000.
Nelson, Herbert L. Dual-mode sound-producing toy. 4,080,754, Cl. 46-228.000.
Nelson, Norman A., to Upjohn Company, The. 2-Decarboxy-2-aminomethyl-PGF$_\alpha$ compounds. 4,081,478, Cl. 260-563.00R.
Nelson, Stephen J., to Upjohn Company, The. N-[(phosphinyl) amino]thio- and N-[(phosphinothioyl)amino]-thio-methylcarbamates and methods for controlling insects. 4,081,536, Cl. 424-211.000.
Nelson, Verner R.: *See*—
Immer, Hans U.; Nelson, Verner R.; and Sestanj, Kazimir, 4,081,530, Cl. 424-177.000.
Nesbitt, Ethan Allen: *See*—
Mendelsohn, Lewis Isaac; Durand, Kevin James; and Nesbitt, Ethan Allen, 4,081,298, Cl. 148-121.000.
Nestor, Kenneth W.: *See*—
Kueneman, Joseph A.; Nestor, Kenneth W.; and Miera, Adolph J., 4,081,600, Cl. 174-68.500.
Neti, Radhakrishna Murty; and Cederstrand, Carl Nelson, to Beckman Instruments, Inc. Method and apparatus for the chemiluminescent detection of HCl. 4,081,247, Cl. 23-232.00E.
Neu, Gustav, to Bochumer Eisenhutte Heintzmann GmbH & Co. Arrangement for supporting roofs of underground excavations. 4,080,794, Cl. 61-45.00D.
Neumann, Gerhard, to Dornier System GmbH. Stepping motor. 4,081,702, Cl. 310-49.00R.
Neusel, Rolf. Microphone, particularly for body sounds, with slip coupling to the transducer element. 4,081,628, Cl. 179-121.00R.
Neustadt, Bernard R., to Schering Corporation. Para-polyfluoroisopropyl-anilino-2-oxazoline compounds, pharmaceutical compositions and method of treating hypertension. 4,081,547, Cl. 424-272.000.
Nguyen, Thomas X. T., to Rucker Company, The. Shear rams for hydrogen sulfide service. 4,081,027, Cl. 166-55.000.
Nichol, Kenneth J.: *See*—
Baker, Maurice W.; Kerry, John C.; Kozlik, Antonin; Marshall, John R.; Nichol, Kenneth J.; and Weighton, David M., 4,081,540, Cl. 424-248.510.
Nicks, Peter Francis: *See*—
Doroszkowski, Andrew; and Nicks, Peter Francis, 4,081,412, Cl. 260-22.0CQ.
Niederer, Otto C., to Design & Manufacturing Corporation. Three-position, self-centering valve for control of fluid actuators and the like. 4,080,992, Cl. 137-636.000.
Nielsen, Anker J., Jr. Locking devices for electric meter boxes. 4,080,811, Cl. 70-164.000.
Nielsen, Irene L. Obstetrical support and pan article. 4,080,968, Cl. 128-292.000.
Nielsen, Jacob August, to Kosan Crisplant A/S. Conveyor systems. 4,081,071, Cl. 198-365.000.
Nieuweboer, Gerrit, to Du Pont de Nemours, E. I., and Company. X-ray film cassette and method of making same. 4,081,686, Cl. 250-480.000.
Nihon Radiator Co., Ltd.: *See*—
Sakai, Yoshiharu, 4,081,102, Cl. 220-203.000.
Nikami, Akira; and Kuriki, Choei, to Sony Corporation. DC motor control circuit. 4,081,728, Cl. 318-318.000.
Ninomiya, Takeshi, to Sony Corporation. Video time base corrector. 4,081,826, Cl. 358-8.000.
Nippon Chemiphar Co., Ltd.: *See*—
Suzuki, Shuichi; Aizawa, Masuo; Ishigur, Isao; Shinohara, Rikio; and Nagamura, Yoichi, 4,081,334, Cl. 204-1.00T.

Nippon Electric Co., Ltd.: *See—*
Akiyama, Hideo, 4,081,833, Cl. 358-153.000.
Yamamoto, Masami; Yamazaki, Fumiaki; Hosoda, Akira; Hashimoto, Hiromi; and Tan, Yoichi, 4,081,790, Cl. 340-146.1BE.

Nippon Gakki Seizo Kabushiki Kaisha: *See—*
Hiyoshi, Teruo; Nakada, Akira; Yamada, Shigeru; Ichikawa, Kiyoshi; and Ishii, Shigeki, 4,080,862, Cl. 84-1.240.

Nippon Kayaku Kabushiki Kaisha: *See—*
Takiyama, Eiichiro; Sugimoto, Toshiaki; Yamaguchi, Goichi; and Nagao, Susumu, 4,081,591, Cl. 526-217.000.

Nippon Oil Company Ltd.: *See—*
Matubara, Saburo; and Iwai, Sakuya, 4,081,415, Cl. 260-28.5AV.

Nippon Soken, Inc.: *See—*
Akita, Sigeyuki; and Yoshida, Shuzo, 4,080,828, Cl. 73-308.000.

Nippon Steel Corporation: *See—*
Shindou, Yoshio; and Nakamura, Makoto, 4,081,344, Cl. 204-181.00R.

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Kitawaki, Nobuhiko; and Hashimoto, Shinichiro, 4,081,605, Cl. 179-1.0SC.
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Nippon Tsu Shin Kogyo K.K.: *See—*
Hamatani, Fumikazu; Ichikawa, Mikihiro; and Tanaka, Yuji, 4,081,625, Cl. 179-99.000.
Kerman, Stephen E.; and Tsutsumi, Fumio, 4,081,624, Cl. 179-99.000.

Nishihama, Hitoshi; Gotoda, Katsuhiko; Motomura, Minoru; Nakajima, Takanobu; and Aizawa, Tatsuo, to Mita Industrial Co. Ltd. Method for developing electrostatic latent images. 4,081,571, Cl. 427-18.000.

Nissan Motor Company, Limited: *See—*
Iizuka, Haruhiko, 4,080,947, Cl. 123-198.00F.

Nitzsche, Klaus, to International Standard Electric Corporation. Groove ring for toroidal-coil deflection unit. 4,081,773, Cl. 335-213.000.

Noble, John H.: *See—*
Gans, Daniel, Jr.; and Noble, John H., 4,081,323, Cl. 176-38.000.

Noguchi, Masaaki; Tanaka, Yukiyasu; Sekiya, Setsuro; and Motosugi, Katsuhiko, to Toyota Jidosha Kogyo Kabushiki Kaisha. Combustion apparatus for an internal combustion engine. 4,080,938, Cl. 123-75.00B.

Noichl, Olaf J.: *See—*
Block, Charles S.; Chen, Michael S.; Noichl, Olaf J.; and Hong, Sun-nan, 4,081,368, Cl. 210-14.000.

Noll, A. Michael: *See—*
Goodman, David Joel; Johnston, James David; and Noll, A. Michael, 4,081,620, Cl. 179-81.00A.

Nomine, Harold; and Schempp, Eberhard G., to Pennsylvania Engineering Corporation. Gas cleaning system for metallurgical apparatus. 4,081,269, Cl. 75-60.000.

Noordergraaf, Abraham: *See—*
McNally, Robert T.; Engelman, Karl; and Noordergraaf, Abraham, 4,080,966, Cl. 128-214.00E.

Norris, Alan H.: *See—*
Chambley, Phillip W.; and Norris, Alan H., 4,080,772, Cl. 53-116.000.

North American Philips Corporation: *See—*
Madsen, Elmer W.; and Hansen, Charles W., 4,081,703, Cl. 310-49.00R.

Northcote, Reginald Dennis; and Osborne, Frank William, to Parkinson Cowan GWB Limited. Apparatus for feeding solid fuel to a furnace grate. 4,080,931, Cl. 122-149.000.

Northcote, Reginald Dennis, to Parkinson Cowan GWB Limited. Industrial boilers. 4,080,932, Cl. 122-149.000.

Northern Illinois Gas Company: *See—*
Batz, James E., 4,081,748, Cl. 325-56.000.

Noteiteirs, Victor Rosallie, to U.S. Philips Corporation. Incandescent lamp-reflector unit. 4,081,708, Cl. 313-113.000.

Nouvertne, Werner: *See—*
Freitag, Dieter; Nouvertne, Werner; and Kleiner, Frank, 4,081,495, Cl. 260-860.000.

Novak, Robert M.: *See—*
Hall, John B.; Sprecker, Mark A.; Vock, Manfred Hugo; Shuster, Edward J.; Vinals, Joaquin; and Novak, Robert M., 4,081,483, Cl. 260-598.000.

Nudinger, Gunter: *See—*
Hemala, Zdenek; Nudinger, Gunter; Wehrmeister, Gerhard; Mair, Reinhard; and Wurster, Erich, 4,080,776, Cl. 57-34.00R.

Nys, Pierre Herman: *See—*
Corluy, Hans Josephus; Schelfaut, Francois Leon; Nys, Pierre Herman; and Bortels, Raoul Jan, 4,081,280, Cl. 96-50.00A.

O. M. Scott & Sons Company, The: *See—*
Smith, Gary L.; and Reese, Dennis Eugene, 4,081,453, Cl. 260-302.00D.

Oag, Edward James. Bottle cleaning apparatus. 4,080,974, Cl. 134-62.000.

Oakland Corporation, The: *See—*
Wallace, Richard B., 4,081,012, Cl. 151-14.500.

Oberle, Arthur, to BBC Brown Boveri & Company Limited. Safety system for a steam turbine installation. 4,080,790, Cl. 60-661.000.

O'Brien, Kevin P. Ridable recreation device. 4,081,182, Cl. 272-114.000.

Oce-van der Grinten, N.V.: *See—*
Wetzer, Antonius F. A. M., 4,081,212, Cl. 355-3.0TR.

Ochi, Shigeyuki; and Hagiawara, Yoshiaki, to Sony Corporation. Solid state image sensor. 4,081,841, Cl. 358-213.000.

Oda, Minoru; and Badono, Shinzi, to Mitsubishi Denki Kabushiki Kaisha. Current squaring circuit. 4,081,696, Cl. 307-229.000.

O'Donnell, James M., to Orgonics, Inc. Process for dewatering organic waste product. 4,081,366, Cl. 210-10.000.

Oellers, Walter, to Trutzschier GmbH & Co. KG. Device for cleaning textile fiber flocks. 4,080,688, Cl. 19-204.000.

Oetliker, Rudy: *See—*
Richardson, Bruce E.; Oetliker, Rudy; and Grierson, W. Doug, 4,081,078, Cl. 209-82.000.

Offshore Company, The: *See—*
Edling, Porter Russell; and Reusswig, Gerhard Helmut, 4,080,796, Cl. 61-88.000.
Reusswig, Gerhard Helmut; Bozeman, James Dee; and Ray, Don Reagan, 4,080,798, Cl. 61-103.000.

Ogasawara, Tsunehiko, to Aisin Seiki Kabushiki Kaisha. Governor valve. 4,080,977, Cl. 137-56.000.

Ogawa, Francis T., to Statitrol Corporation. Apparatus and method for detecting the occurrence of an alarm condition. 4,081,795, Cl. 340-237.00S.

Ogawa, Toshio: *See—*
Kuroda, Masao; Kondo, Toshio; Ono, Sekijyuro; and Ogawa, Toshio, 4,080,838, Cl. 73-612.000.

O'Hara, Matthew J.: *See—*
Hawkins, Albert W.; O'Hara, Matthew J.; Gortsema, Frank P.; and Hedaya, Eddie, 4,081,574, Cl. 427-237.000.

Ohlenschlager, Lothar; Fromhein, Olaf; and Rapp, Wilhelm, to Gesellschaft fur Kernforschung m.b.H. Locating and identifying a radioactive uranium and/or transuranium isotope deposited in a wound. 4,081,682, Cl. 250-362.000.

Ohmura, Ryuichi, to Fuji Kogyo Co., Ltd. Line guide assembly for fishing rods. 4,080,748, Cl. 43-24.000.

Okada, Kyoto: *See—*
Nagata, Wataru; Narisada, Masayuki; Hamashima, Yoshio; and Okada, Kyoto, 4,081,595, Cl. 544-23.000.

Okada, Yoshio: *See—*
Tokumitsu, Ichiro; Konuma, Hideo; Mochizuki, Shigeaki; Okada, Yoshio; Yasumoto, Hiroshi; and Yoshihiro, Isao, 4,081,497, Cl. 260-880.00R.

Okano, Michiaki, to Tokyo Shibaura Electric Co., Ltd. Facsimile transmission apparatus. 4,081,843, Cl. 358-294.000.

O'Keefe, Verne D.: *See—*
Liebrenz, Allan L.; O'Keefe, Verne D.; and Soderberg, Richard V., 4,080,825, Cl. 73-150.00A.

Okui, Yuji: *See—*
Arendash, Joseph M.; and Okui, Yuji, 4,080,913, Cl. 112-258.000.

Okuma Machinery Works, Ltd.: *See—*
Goto, Yoshiaki, 4,080,853, Cl. 82-2.00R.

Olander, Karl Erik, to Alfa-Laval AB. Pulsator for milking machines. 4,080,995, Cl. 137-624.150.

O'Leary, Stephen H., to IVAC Corporation. Parenteral syringe pump drive system with installation indicator means. 4,080,967, Cl. 128-214.00F.

Olin Corporation: *See—*
Chatfield, Phillip A.; and Gullotti, Damian V., 4,080,702, Cl. 29-157.30V.
Kadija, Igor V.; and Woodard, Kenneth E., Jr., 4,081,350, Cl. 204-296.000.
Kleine, Charles A.; and Middleton, Verne L., 4,081,026, Cl. 165-170.000.

Olrik, Hans H.; and Jacobsen, Hans C. L. Bridge. 4,080,681, Cl. 14-1.000.

Olson, John Emery, to Heath Company. On-screen channel display. 4,081,797, Cl. 340-324.0AD.

Olson, Leonard. Rotary internal combustion engine. 4,080,935, Cl. 123-205.000.

Onda, Eiichi; and Watanabe, Masanori, to Seiko Koki Kabushiki Kaisha. Opening and closing device for camera shutter. 4,081,810, Cl. 354-246.000.

O'Neill, James L., to Merkert Enterprises, Inc. Dispenser box construction. 4,081,128, Cl. 229-17.0SC.

Onikov, Eduard Arshakovich: *See—*
Borodin, Valerian Alexeevich; Onikov, Eduard Arshakovich; Sakharov, Boris Alexandrovich; Zabotin, Alexandr Alexandrovich; Loschilin, Evgeny Dmitrievich; and Galperin, Alexandr Lvovich, 4,081,001, Cl. 139-436.000.

Onishi, Masanori; Yoshikawa, Tadashi; Ikoma, Kiyoshi; and Nakakohara, Tetsuya, to Matsushita Electric Industrial Co., Ltd. Push rod type tape recorder operating device. 4,081,849, Cl. 360-137.000.

Ono, Hiroshi, to Shibuya-Kogya Company, Ltd. Feeding apparatus for caps made of magnetic substance. 4,081,069, Cl. 198-384.000.

Ono, Hiroshi; and Inoue, Shigeru, to Mitsui Toatsu Chemicals. Process for separating and recovering unreacted materials in urea synthesis. 4,081,469, Cl. 260-555.00A.

Ono, Sekijyuro: *See—*
Kuroda, Masao; Kondo, Toshio; Ono, Sekijyuro; and Ogawa, Toshio, 4,080,838, Cl. 73-612.000.

Opedal, Halldor: *See—*
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Optical Coating Laboratory, Inc.: *See—*
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Orgonics, Inc.: *See—*
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Orobis Limited: *See—*
Richardson, Adrian, 4,081,390, Cl. 252-59.000.

Orogil: *See—*
Soula, Gerard; and Duteurtre, Philippe, 4,081,388, Cl. 252-51.50A.
Osborg, Hans. Method of improving combustion of fuels and fuel compositions. 4,081,252, Cl. 44-53.000.
Osborne, Frank William: *See—*
Northcote, Reginald Dennis; and Osborne, Frank William, 4,080,931, Cl. 122-149.000.
Oscar Mayer & Co. Inc.: *See—*
Borsuk, Alvin, 4,081,564, Cl. 426-513.000.
Osso, John M.: *See—*
Seifert, Peter; Chupka, David E.; Getz, Lynn L.; Hatton, Derald R.; Thomas, R. Marvin; Osso, John M.; and Rogl, Herbert A., 4,081,147, Cl. 241-261.300.
Osterried, James L. Kit of parts for forming a curved member, and curved member formed thereby. 4,080,742, Cl. 33-177.000.
O'Sullivan, James C.; McAvoy, Patrick J.; and Jeffery, Glynn B., to Institute for Industrial Research and Standards. Knitting machine. 4,080,806, Cl. 66-64.000.
Otto, Friedrich, to A. Stephan U. Sohne GmbH & Co. Process for producing a confection from seed vessels. 4,081,570, Cl. 426-629.000.
Outboard Marine Corporation: *See—*
Hines, Charles E., 4,081,034, Cl. 172-22.000.
Owens-Illinois, Inc.: *See—*
Bode, Wolfgang W.; and Fein, Michael E., 4,081,712, Cl. 313-226.000.
Oxy Metal Industries Corporation: *See—*
Fogo, Denis S.; and Skaggs, Roy W., Jr., 4,081,346, Cl. 204-213.000.
Ozaki, Masaaki: *See—*
Ishii, Makoto; Iiyama, Masahiko; and Ozaki, Masaaki, 4,081,499, Cl. 261-39.00E.
Ozaki, Toshiaki: *See—*
Hashimoto, Shunichi; Kirino, Osamu; Ozaki, Toshiaki; and Yamashita, Norihisa, 4,081,267, Cl. 71-93.000.
P. D. George Company, The: *See—*
Lange, Daniel J., 4,081,427, Cl. 260-75.00N.
P. R. Mallory & Co. Inc.: *See—*
Booe, James M., 4,081,397, Cl. 252-194.000.
Johnson, Ronald M., 4,081,705, Cl. 310-90.000.
Pacansky, Thomas J., to Xerox Corporation. Preparation of hydrophilic lithographic printing masters. 4,081,572, Cl. 427-53.000.
Paivanas, John Angelo: *See—*
Hassan, Javathu Kutikaran; and Paivanas, John Angelo, 4,081,201, Cl. 302-2.00R.
Pakhter, Ilya Kharitonovich: *See—*
Repolovsky, Alexandr Ivanovich; Pakhter, Ilya Kharitonovich; Rudakov, Alexei Dmitrievich; Baranov, Alexandr Nikolaevich; Gliner, Leonid Efimovich; Gapoian, Dmitry Trdatovich; and Tumasiants, Igor Veniaminovich, 4,080,875, Cl. 92-29.000.
Palmer, Peter, to ASEA Aktiebolag. On-load tap changer. 4,081,741, Cl. 323-43.50R.
Palumbo, Arnaldo. Toy aircraft. 4,080,750, Cl. 46-1.00R.
Paniri, Zvi; and Rudd, Thomas H., to Canada Wire and Cable Limited. Self-supporting cable. 4,081,602, Cl. 174-103.000.
Papenfuhs, Theodor, to Hoechst Aktiengesellschaft. Process for the preparation of 4-amino-1,8-naphthalic acid-N-arylimides. 4,081,446, Cl. 260-281.00N.
Paraskos, John A.: *See—*
Hildebrand, Richard E.; Montagna, Angelo A.; and Paraskos, John A., 4,081,361, Cl. 208-10.000.
Parkinson Cowan GWB Limited: *See—*
Northcote, Reginald Dennis; and Osborne, Frank William, 4,080,931, Cl. 122-149.000.
Northcote, Reginald Dennis, 4,080,932, Cl. 122-149.000.
Parks, Harold G.; and Kirkpatrick, Conilee G., to General Electric Company. Alloy junction archival memory plane and methods for writing data thereon. 4,081,794, Cl. 365-118.000.
Parrillo, Henry; Harrington, John Sherman; and Curtis, Glenn Howard, to Marshall and Williams Company. Tenter guide rail gap crossing mechanism. 4,080,692, Cl. 26-91.000.
Patheiger, Hannelore, heir: *See—*
Traenckner, Hans-Joachim; Fuhr, Karl; Rosenkranz, Hans Jurgen; Patheiger, Manfred, deceased; and Rudolph, Hans, 4,081,492, Cl. 260-837.00R.
Patheiger, Manfred, deceased: *See—*
Traenckner, Hans-Joachim; Fuhr, Karl; Rosenkranz, Hans Jurgen; Patheiger, Manfred, deceased; and Rudolph, Hans, 4,081,492, Cl. 260-837.00R.
Patin, Claude Guy, to Compagnie des Etablissements de la Risle. Multilayer article and a process and an apparatus for its manufacture. 4,081,305, Cl. 156-204.000.
Patterson, John F.: *See—*
Flora, Barney S.; and Patterson, John F., 4,081,324, Cl. 176-78.000.
Pattyn, Herman Alberik: *See—*
Vanassche, Willy Joseph; Pattyn, Herman Alberik; and Borginon, Hendrik Alfons, 4,081,281, Cl. 96-64.000.
Paul, James E., Jr.: *See—*
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Paulson, John K.; and Steffan, Walter J., to Jo Paul Industries, Inc. Ball throwing device. 4,080,950, Cl. 124-1.000.
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Hoffmann, Werner; Himmele, Walter; Paust, Joachim; Von Fraunberg, Karl; Siegel, Hardo; and Pfohl, Sigberg, 4,081,477, Cl. 260-563.00P.
Pauty, Bernard, to SEB S.A. Domestic electric squeezer. 4,080,885, Cl. 99-501.000.
Pay Television Corporation: *See—*
Sherman, Herbert, 4,081,832, Cl. 358-124.000.
Payen, Jose: *See—*
Mestre, Pierre; and Payen, Jose, 4,081,263, Cl. 65-106.000.
Payne, Larry E.; and Lancaster, Kenneth D., Jr. Low voltage photoswitch. 4,081,729, Cl. 318-480.000.
Pearce, Jim: *See—*
Cattell, Kerry Arthur; Moore, Roy Spencer; and Pearce, Jim, 4,081,020, Cl. 164-122.000.
Pearce, Peter J., to Synestructics, Inc. Monocoque arched kite. 4,081,158, Cl. 244-153.00R.
Pearce, Ralph Reginald, to E M I Limited. Credit cards and other security documents. 4,081,132, Cl. 235-493.000.
Pech, David J.: *See—*
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Peech, John M.: *See—*
Mottola, Elia A.; East, George H., Jr.; Goldstein, Norman A.; Huang, Wu-Cheng; Peech, John M.; Pirotin, Shelden D.; Roemer, Robert E.; and Spada, Albert J., 4,080,998, Cl. 138-107.000.
Peerless Electric Ltd.: *See—*
Corbeil, Paul, 4,081,665, Cl. 362-223.000.
Pehrson, Jens Erland; Roos, Sture Gosta; and Valastro, Bartolo, to Telefonaktiebolaget L M Ericsson. Clock supervision in digital systems. 4,081,662, Cl. 235-308.000.
Pelfrey, Lowell Sherman. Let-ball detectors. 4,081,798, Cl. 340-323.00R.
Pemberton, Denver L.; and Smith, Elmer E., to Anaconda Company, The. Fixed center tooling for an extruder that provides for concentric layers of coating material. 4,081,232, Cl. 425-463.000.
Penland, Thomas K. Engine moisture induction system. 4,080,936, Cl. 123-25.00A.
Pennell, Anthony Robin, to Associated Portland Cement Manufacturers Limited, The. Portland cement manufacture. 4,081,285, Cl. 106-100.000.
Penney, Carl M.; and Lapp, Marshall, to General Electric Company. Stable two-channel, single-filter spectrometer. 4,081,215, Cl. 356-45.000.
Penney, Richard C. Tray for tubular armchair. 4,081,198, Cl. 297-153.000.
Pennsylvania Engineering Corporation: *See—*
Nomine, Harold; and Schempp, Eberhard G., 4,081,269, Cl. 75-60.000.
Pennwalt Corporation: *See—*
Talley, Charles Bullick, 4,081,395, Cl. 252-106.000.
Percarpio, Peter E.: *See—*
Shichman, Daniel; Percarpio, Peter E.; and Black, Sheppard A., 4,081,310, Cl. 156-398.000.
Pereira, Ernest G.; and Fitch, Guy W., to Cotton Machinery Company, Inc. Conveyor-trailer for transporting an agricultural commodity. 4,081,094, Cl. 214-355.000.
Perkins, Roger: *See—*
Nagel, Hartmut; and Perkins, Roger, 4,081,297, Cl. 148-103.000.
Perretta, Michael L. Apparent wind indication device. 4,080,826, Cl. 73-188.000.
Perri, Michael J.; and Zumwalt, Glen A., to Stauffer Chemical Company of Wyoming. Dust-collecting head. 4,081,041, Cl. 175-209.000.
Peter Stuyvesant of Canada, Limited: *See—*
Barnard, Edward G., 4,081,126, Cl. 229-44.0CB.
Peters, Edwin F.; and Boone, David E., to Standard Oil Company, The. Elimination of fibrous polymers. 4,081,589, Cl. 526-97.000.
Peterson, Anders Adolf, to Hardinge Brothers, Inc. Adjustable tool holder. 4,080,854, Cl. 82-36.00R.
Peterson, Karl F., to United States of America, Navy. Re-entry telemetry system. 4,081,749, Cl. 325-113.000.
Petit, Guy: *See—*
Aubert, Gilles; and Petit, Guy, 4,081,322, Cl. 176-37.000.
Petry, Gene A., to United States of America, Air Force. Aircraft conveyor load redistribution system. 4,081,157, Cl. 244-137.00R.
Petterson, Tor H. Strip potentiometer. 4,081,781, Cl. 338-196.000.
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Pfefferkorn, Hans; Pfefferkorn, Bernd; and Reiter, Viktor, 4,081,720, Cl. 215-354.000.
Pfefferkorn, Hans; Pfefferkorn, Bernd; and Reiter, Viktor. Stopper device. 4,081,720, Cl. 215-354.000.
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Armstrong, William W., 4,081,528, Cl. 424-80.000.
Celmer, Walter D.; Cullen, Walter P.; Moppett, Charles E.; Routien, John B.; Jefferson, Mark T.; Shibakawa, Riichiro; and Tone, Junsuke, 4,081,532, Cl. 424-122.000.
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Pfohl, Sigberg: *See—*
Hoffmann, Werner; Himmele, Walter; Paust, Joachim; Von Fraunberg, Karl; Siegel, Hardo; and Pfohl, Sigberg, 4,081,477, Cl. 260-563.00P.
Pfundt, Heimer; Fuchs, Manfred; and Voib, Paul, to Vereinigte Aluminium-Werke Aktiengesellschaft. Method for the production of gallium oxide. 4,081,523, Cl. 423-624.000.

Phillips Fibers Corporation: *See—*
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Phillips Petroleum Company: *See—*
Bartz, Gerald L., 4,081,675, Cl. 250-255.000.
Short, James N.; and Witt, Donald R., 4,081,407, Cl. 252-458.000.
Stapp, Paul R., 4,081,486, Cl. 260-638.00R.
Phillips, Thomas E., to Baxter Travenol Laboratories, Inc. In-line cannula valve assembly. 4,080,965, Cl. 128-214.00D.
Piber, Earl T., to Cutler-Hammer, Inc. Toggle switch with hinged split housing and insulation piercing contacts. 4,081,641, Cl. 200-153.0L.A.
Picard, Paul, to C.E.R.C.A., Compagnie pour l'Etude et la Realisation de Combustibles Atomiques. Method of high temperature assembly. 4,081,121, Cl. 228-181.000.
Pichon, Michel, to Compagnie Internationale pour l'Informatique Cii-Honeywell Bull. Apparatus for automatically measuring the resistance and heating up of resistive electrical components. 4,080,829, Cl. 73-362.0AR.
Pickering, Timothy L.: *See—*
Shen, Kwan Ting; and Pickering, Timothy L., 4,081,417, Cl. 260-29.2EP.
Pierce, Paul, Jr., to B. H. Bunn Company. Automatic clutch lock out mechanism for package tying machine. 4,080,886, Cl. 100-4.000.
Pierce, Percy E.: *See—*
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Pilz, Bodo: *See—*
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Piontkowski, Henry: *See—*
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Pitchon, Esra: *See—*
Meyer, Franklyn Wallace; Pitchon, Esra; and Earle, Ernest Lord, Jr., 4,081,561, Cl. 426-385.000.
Pizzuti, Donato F., to Polaroid Corporation. Erecting linkage and cover assembly for photographic cameras. 4,081,808, Cl. 354-193.000.
Piank, Charles J.; Rosinski, Edward J.; and Rubin, Mae K., to Mobil Oil Corporation. Hydrocarbon conversion over ZSM-35. 4,081,490, Cl. 260-673.000.
Plasteco, Inc.: *See—*
Sandow, Kiyoshi, 4,081,111, Cl. 222-309.000.
Platakis, Nicolaos S.; and Gatos, Harry C., to Massachusetts Institute of Technology. Apparatus for growing films by flash vaporization. 4,080,926, Cl. 118-5.000.
Platt, Eric Gordon: *See—*
Reines, Jose; Platt, Eric Gordon; White, Stanley Earl; Mahood, Robert John; and Corrado, Joseph Michael, 4,081,613, Cl. 179-18.00J.
Playart Limited: *See—*
Tong, Duncan, 4,081,133, Cl. 238-10.00F.
Pleska, Jean-Pierre; and Marechal, Michel, to Solvay & Cie. Process for the manufacture of short fibrils and devices for carrying it out. 4,081,226, Cl. 425-6.000.
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Davies, Terrence Ardern, 4,081,644, Cl. 200-266.000.
Pluenneke, Ricks H. Pot water. 4,081,265, Cl. 71-33.000.
Plumb, Richard L.: *See—*
Elmore, Richard E.; and Plumb, Richard L., 4,081,802, Cl. 343-5.0ST.
PMCMA Research Group: *See—*
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Pneumo Corporation: *See—*
Bauer, Dan O.; and Salemka, Robert M., 4,080,873, Cl. 91-446.000.
Polaroid Corporation: *See—*
Buckler, Sheldon A., 4,080,728, Cl. 29-623.400.
Muggli, Juerg; and Specht, Manfred G., 4,081,626, Cl. 179-111.00R.
Pizzuti, Donato F., 4,081,808, Cl. 354-193.000.
Poler, Stanley. Method of making an intra-ocular lens. 4,080,709, Cl. 29-412.000.
Polhall, Karl-Olof Adolf; and Johnsen, Arne, to Morgardshammar Aktiebolag. Shears for cropping wire, moving at high speed. 4,080,859, Cl. 83-306.000.
Polito, Alan J.; and Knight, William S., to Beckman Instruments, Inc. Immunoassay procedure employing novel immunochemical composites. 4,081,244, Cl. 23-230.600.
Polito, Alan J., to Beckman Instruments, Inc. Immunoassay procedure employing novel immunochemical composites. 4,081,245, Cl. 23-230.600.
Polito, Alan J.; and Knight, William S., to Beckman Instruments, Inc. Solid phase column immunoassay procedure employing novel immunochemical composites. 4,081,246, Cl. 23-230.600.
Pollard, Jean; and Pollard, Pierre. Methods and apparatus for making writing legible by a machine for recognizing shapes. 4,081,791, Cl. 340-146.30A.
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Pollard, Jean; and Pollard, Pierre, 4,081,791, Cl. 340-146.30A.
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Wilson, Woodrow S.; and Hazard, Robert E., 4,081,108, Cl. 222-153.000.
Porzsolt, Franz; Tautz, Christoph; Schmidtberger, Rudolf; Ax, Wolfgang; and Enders, Burkhard, to Behringwerke Aktiengesellschaft. Diagnostic process. 4,081,241, Cl. 23-230.00B.
Possis Corporation: *See—*
Le Vasseur, Arnold P., 4,081,072, Cl. 198-394.000.
Post, Gerhard K., to Raymond Lee Organization, Inc., The. Engine heated compressed drive for vehicle air conditioner. 4,080,801, Cl. 62-238.000.
Pousaz, Robert: *See—*
Horisberger, Marc; Sozzi, Tomaso; and Pousaz, Robert, 4,081,330, Cl. 195-66.00R.
Powers, John R.; and Miller, Frances C., to Westvaco Corporation. C_{22}-Cycloaliphatic tricarboxylic fatty acid soaps. 4,081,462, Cl. 260-501.100.
Powers Manufacturing, Inc.: *See—*
Zappia, Anthony T., 4,081,073, Cl. 198-430.000.
PPG Industries, Inc.: *See—*
Christenson, Roger M.; Bosso, Joseph F.; Hartman, Marvis E.; and Chang, Wen-Hsuan, 4,081,341, Cl. 204-181.00C.
Fuhrman, Philip K.; and Greiner, Robert A., Jr., 4,081,262, Cl. 65-65.00A.
Iiams, George A., 4,081,193, Cl. 294-118.000.
Littell, Harry E., Jr., 4,081,581, Cl. 428-138.000.
Schimmel, Karl F.; Pierce, Percy E.; and Jones, James E., 4,081,343, Cl. 204-181.00C.
Tilton, Robert L., 4,081,261, Cl. 65-65.00A.
Pracht, Hans J., to Proctor & Gamble Company, The. Solvent-free capsules and fabric conditioning compositions containing same. 4,081,384, Cl. 252-8.800.
Prasad, Raj Nandan; Stein, Herman Hal; and Tietje, Karin Rosemarie, to Abbott Laboratories. 5-[2-Hydroxy-3-(3,4-dimethoxy phenethylamino)]-propoxy-3,4-dihydro carbostyril and pharmaceutically acceptable salts thereof. 4,081,447, Cl. 260-288.00R.
Precise Corporation: *See—*
York, Richard N.; and York, David L., 4,081,687, Cl. 250-505.000.
Presby, Benedict F., to Knoll International, Inc. Spring-loaded drawer partition. 4,081,100, Cl. 220-22.400.
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Thompson, David S.; Prestley, John S., Jr.; and Spangler, Grant E., 4,081,294, Cl. 148-11.50A.
Preun, Hugo: *See—*
Flaschar, Heinz; Kroll, Peter; Thomassen, Petrus; Kleinschmidt, Heinz; and Preun, Hugo, 4,080,994, Cl. 137-596.130.
Preuss, Robert K.: *See—*
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Preusser, Gerhard; Schulze, Martin; Richter, Klaus; and Huwels, Wilhelm, to Krupp-Koppers GmbH. Process for recovering highly pure aromatics from a mixture of aromatics and non-aromatics. 4,081,355, Cl. 208-313.000.
Price, Robert; Jacoby, George V.; and Geffon, Arthur P., to Sperry Rand Corporation. Dual channel signal detector circuit. 4,081,756, Cl. 328-117.000.
Prochazka, Svante; and Coblenz, William S., to General Electric Company. Silicon carbide-boron carbide sintered body. 4,081,284, Cl. 106-44.000.
Procter & Gamble Company, The: *See—*
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Mathais, Henri; and Weiss, Francis, 4,081,459, Cl. 260-340.700.
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Progressive Research Products, Inc.: *See—*
Carosello, Theodore F., 4,081,392, Cl. 252-62.000.
Proplesch, Peter; and Zimmer, Erich, to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung. Method for recovering nonferrous metals from hydro-thermal slime. 4,081,506, Cl. 423-41.000.
Protective Treatments, Inc.: *See—*
Wenrick, Brian A.; and Gross, Michael G., 4,081,504, Cl. 264-174.000.
Pruder, Gary David; and Greenhaugh, Earl Elwood, to University of Delaware. Bivalve molluscs rearing process. 4,080,930, Cl. 119-4.000.
Pruitt, Mike D. Embalming machine flow control apparatus. 4,080,693, Cl. 27-24.00R.
Pshenichny, Gennady Ivanovich: *See—*
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Pukhly, Zhanneta Alexandrovna: *See—*
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Pulsifer, Ernest K. Method and apparatus for using automotive tires as earth engineering devices. 4,080,793, Cl. 61-37.000.
Puretic, Mario J. Fish flume apparatus. 4,081,075, Cl. 198-812.000.
Queen, David Stewart; Bell, Peter William; Dick, Thomas Hutcheson; and Edgar, John Black, to Sidlaw Industries Limited. Pile composite fabric with foamed adhesive. 4,081,579, Cl. 428-95.000.
Rajala, Robert L.: *See—*
Granberg, Mauritz L.; Hanson, David G.; and Rajala, Robert L., 4,081,799, Cl. 340-324.0AD.

Rall, Bernhard: *See—*
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Rand Corporation, The: *See—*
Augenstein, Bruno W.; and Dougherty, Charles B., 4,080,900, Cl. 102-67.000.

Randolph, Robert W.; and Jantzen, Steven L., to ACF Industries, Incorporated. Apparatus method for welding tank sections. 4,081,651, Cl. 219-61.000.

Rank Organisation Limited, The: *See—*
Siddall, Graham John; and Garratt, David, 4,080,741, Cl. 33-174.00L.

Ranzanigo, Pierluigie, to Bassani Ticino S.p.A. Housing insert for receptable seat. 4,081,779, Cl. 337-198.000.

Rapp, Wilhelm: *See—*
Ohlenschlager, Lothar; Fromhein, Olaf; and Rapp, Wilhelm, 4,081,682, Cl. 250-362.000.

Ratanangsu, Srinkarn. Electronic display system for musical instruments. 4,080,867, Cl. 84-477.00R.

Rauland-Borg Corporation: *See—*
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Ravis, James C.; and Hedman, Curtis P., to United States of America, Air Force. Dual class amphibious target discriminator. 4,081,785, Cl. 340-5.00R.

Ray, David J., to United States of America, Air Force. Resistance bridge transducer conditioning circuit. 4,081,744, Cl. 324-63.000.

Ray, Don Reagan: *See—*
Reusswig, Gerhard Helmut; Bozeman, James Dee; and Ray, Don Reagan, 4,080,798, Cl. 61-103.000.

Ray, Kenneth Irving: *See—*
Allen, Gordon Hadfield; and Ray, Kenneth Irving, 4,081,695, Cl. 307-209.000.

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Post, Gerhard K., 4,080,801, Cl. 62-238.000.
Rogers, Charles E., 4,080,851, Cl. 81-60.000.
Szwartz, Henry S., 4,081,018, Cl. 160-113.000.
Wester, Sanfrid J., 4,081,022, Cl. 165-11.000.

Razumovsky, Anatoly Fedorovich: *See—*
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RCA Corporation: *See—*
Haferl, Peter Eduard, 4,081,721, Cl. 315-389.000.
Haferl, Peter Eduard, 4,081,722, Cl. 315-393.000.
Klatskin, Jerome Barnard; and Rosen, Arye, 4,080,722, Cl. 29-580.000.
Naidus, Edward Sidney; and Clark, Charles Wheeler, 4,080,763, Cl. 52-200.000.
Steckler, Steven Alan, 4,081,758, Cl. 330-252.000.

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Realty & Industrial Corporation: *See—*
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Redpath Dorman Long (North Sea) Limited: *See—*
Nastasic, Vladimir; Hansen, Frode Johan; Watson, Donald Miller; and Manton, David William, 4,080,916, Cl. 114-65.00R.

Redwine, Donald J.: *See—*
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Reed, Philip W.: *See—*
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Reed, Robert D., to John Zink Company. Liquid aeration to reduce biological oxygen demand. 4,081,378, Cl. 210-177.000.

Reed, Robert D.: *See—*
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Reedy, James D.: *See—*
Yang, Kang; Reedy, James D.; and Lindberg, Robert C., 4,081,512, Cl. 423-240.000.

Reeher, John R.: *See—*
Smith, Ronald D.; Frankel, Steven B.; Reeher, John R.; and Story, Michael S., 4,081,222, Cl. 417-153.000.

Rees, Lancelot H., to Gaulin Corporation. Method and valve apparatus for homogenizing fluid emulsions and dispersions and controlling homogenizing efficiency and uniformity of processed particles. 4,081,863, Cl. 366-176.000.

Reese, Dennis Eugene: *See—*
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Reid, Joyce: *See—*
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Reid, Robert John. Method of joining a ladder rung to a ladder rail. 4,080,713, Cl. 29-469.500.

Reifers, Richard F., to Diamond International Corporation. Dual basis weight multi-walled egg cartor end cells. 4,081,123, Cl. 229-2.5EC.

Reimann, Bernd: *See—*
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Reines, Jose; Platt, Eric Gordon; White, Stanley Earl; Mahood, Robert John; and Corrado, Joseph Michael, to International Telephone and Telegraph Corporation. Bi-directional signalling arrangement for telecommunications systems. 4,081,613, Cl. 179-18.00J.

Reiss, Meyer M., to Atomic Products Corporation. Radioactive shielding material. 4,081,689, Cl. 250-515.000.

Reiter, Viktor: *See—*
Pfefferkorn, Hans; Pfefferkorn, Bernd; and Reiter, Viktor, 4,081,720, Cl. 215-354.000.

Reliance Telecommunication Electronics Company: *See—*
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Renault, Philippe: *See—*
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Rennie, Stanley D.: *See—*
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Repolovsky, Alexandr Ivanovich; Pakhter, Ilya Kharitonovich; Rudakov, Alexei Dmitrievich; Baranov, Alexandr Nikolaevich; Gliner, Leonid Efimovich; Gapoian, Dmitry Trdatovich; and Tumasiants, Igor Veniaminovich. Vehicle braking means. 4,080,875, Cl. 92-29.000.

Research Corporation: *See—*
Wong, John Lui, 4,081,448, Cl. 260-290.0HL.

Resnick, Paul Raphael, to Du Pont de Nemours, E. I., and Company. Catalytic reaction of hexafluoropropylene epoxide with a ketone or acid fluoride. 4,081,466, Cl. 260-544.00F.

Resnick, Paul Raphael, to Du Pont de Nemours, E. I., and Company. Catalytic dimerization of hexafluoropropylene epoxide to form perfluoro-2-(n-propoxy) propionyl fluoride. 4,081,467, Cl. 260-544.00F.

Reusswig, Gerhard Helmut; Bozeman, James Dee; and Ray, Don Reagan, to Offshore Company, The. Arctic drilling base. 4,080,798, Cl. 61-103.000.

Reusswig, Gerhard Helmut: *See—*
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Rexroad, James O.; and Ricci, Louis N., to Westinghouse Electric Corporation. Switch construction and operating mechanism therefor. 4,081,642, Cl. 200-153.00G.

Reynolds Metals Company: *See—*
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Thompson, David S.; Prestley, John S., Jr.; and Spangler, Grant E., 4,081,294, Cl. 148-11.50A.

Rhind, Terence Keith; Andrews, Allen Howe; Burdine, Warren Emil; and Hendrie, John Matthew, to Bourns, Inc. Explosion inhibiting potentiometer assembly and drive mechanism therefor. 4,081,780, Cl. 338-164.000.

Rhone Poulenc Textile: *See—*
Laurent, Maurice, 4,080,808, Cl. 66-125.00R.

Ricart, Emilio Llovet. Cam system for circular knitting machines. 4,080,805, Cl. 66-57.000.

Ricci, Louis N.: *See—*
Rexroad, James O.; and Ricci, Louis N., 4,081,642, Cl. 200-153.00G.

Rice, Paul Patrick, to Johnson Controls, Inc. Differential pressure cutout switch. 4,081,636, Cl. 200-83.00Y.

Rich, Joseph A., to General Electric Company. Compact vacuum switch for high voltage circuit interruption. 4,081,640, Cl. 200-144.00B.

Richard, Monique-Jeanne-Marie, to Etat Francais represente par le Delegue Ministeriel pour l'Armement. Hydrophone having a directive lobe in the form of a cardioid. 4,081,786, Cl. 340-10.000.

Richardson, Adrian, to Orobis Limited. Viscosity index improver composition. 4,081,390, Cl. 252-59.000.

Richardson, Bruce E.; Oetliker, Rudy; and Grierson, W. Doug, to Labatt Breweries of Canada Limited. Article sorting apparatus. 4,081,078, Cl. 209-82.000.

Richardson Company, The: *See—*
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Richman, Paul, to SMC Standard Microsystems Corporation. Method of modifying electrical characteristics of MOS devices using ion implantation. 4,080,718, Cl. 29-571.000.

Richter, Klaus: *See—*
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Ricoh Co., Ltd.: *See—*
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Ridgway Steel Fabricators, Inc.: *See—*
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Riemann, Friedrich: *See—*
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Rinaldo, James D.: *See—*
Bubula, Thomas J.; Franz, Maurice F.; Johnson, Gordon W.; and Rinaldo, James D., 4,080,850, Cl. 74-861.000.

Ripple, David Eugene, to Lubrizol Corporation, The. Phosphorus-containing lubricating compositions. 4,081,387, Cl. 252-46.600.

Rising, Paul Eugene; Jensen, James Wendell; and Cook, Harold, Jr., to Coors Container Company. Container end member with an integral hinged opening tab having indentation thereon. 4,081,104, Cl. 220-268.000.

Robert, Andre, to Upjohn Company, The. Cytoprotective prostaglandins for use in human intestinal diseases. 4,081,553, Cl. 424-305.000.

Robert Bosch GmbH: *See—*
Flaschar, Heinz; Kroll, Peter; Thomassen, Petrus; Kleinschmidt, Heinz; and Preun, Hugo, 4,080,994, Cl. 137-596.130.

Fricke, Hans-Jurgen; and Bosch, Paul, 4,081,223, Cl. 417-218.000.
Lietar, Christian; and Blanc, Jean-Pierre, 4,081,210, Cl. 350-223.000.

Roberts, Hugh Hill; and West, Gary R., to International Minerals & Chemical Corporation. Secondary sampling device. 4,080,831, Cl. 73-421.00A.

Robertshaw Controls Company: *See*—
Stearley, John W.; Rowley, Paul M.; and Buckshaw, Thomas M., 4,081,637, Cl. 200-83.0WM.

Robertson, Cecil C., to Malor Manufacturing, Inc. Combination employing controlled flow check valve. 4,080,988, Cl. 137-513.300.

Robertson, Courtland L.: *See*—
Stevenson, Robert Van Ness; and Robertson, Courtland L., 4,081,851, Cl. 361-42.000.

Robson, Edwin: *See*—
Evans, Dennis Ernest Mackley; and Robson, Edwin, 4,081,588, Cl. 526-87.000.

Rockl, Friedrich; Stocker, Helmut; and Braumann, Gundokar, to Siemens Aktiengesellschaft. Apparatus for damping the bouncing or chatter of relay armatures in the releasing position. 4,081,775, Cl. 335-271.000.

Rockwell International Corporation: *See*—
Esola, John L., 4,080,827, Cl. 73-275.000.
Thompson, Robert B.; and Alers, George A., 4,080,836, Cl. 73-597.000.
Vitols, Visvaldis A.; and Paul, James E., Jr., 4,081,607, Cl. 179-1.0SB.

Rockwell-Rimoldi S.p.A.: *See*—
Marforio, Nerino, 4,080,912, Cl. 112-121.150.

Roehrick, Otto Adolf. Ecolarium lights. 4,081,666, Cl. 362-253.000.

Roemer, Robert E.: *See*—
Mottola, Elia A.; East, George H., Jr.; Goldstein, Norman A.; Huang, Wu-Cheng; Peech, John M.; Pirotin, Shelden D.; Roemer, Robert E.; and Spada, Albert J., 4,080,998, Cl. 138-107.000.

Rogers, Charles E., to Raymond Lee Organization, Inc., The. Variable racket wrench. 4,080,851, Cl. 81-60.000.

Rogers, Earl E., to Chevron Research Company. Steam distribution system for use in a well. 4,081,028, Cl. 166-242.000.

Rogers, Philip A.; and Herr, John F., to Johns-Manville Corporation. Pipe liner laminate and method of making a pipe with said liner. 4,081,303, Cl. 156-192.000.

Rogl, Herbert A.: *See*—
Seifert, Peter; Chupka, David E.; Getz, Lynn L.; Hatton, Derald R.; Thomas, R. Marvin; Osso, John M.; and Rogl, Herbert A., 4,081,147, Cl. 241-261.300.

Rohm GmbH: *See*—
Gruber, Wilhelm; and Schroeder, Guenter, 4,081,465, Cl. 260-526.00N.

Rohm and Haas Company: *See*—
Warburton, Charles E., Jr.; and Benischeck, Joseph J., 4,081,383, Cl. 252-8.600.

Roller, William G., to G & R Industries, Inc. Plural battery control apparatus. 4,081,738, Cl. 320-7.000.

Rolls-Royce Limited: *See*—
Jubb, Albert, 4,080,784, Cl. 60-39.28T.

Ronco, Karl: *See*—
Hari, Stefan; and Ronco, Karl, 4,081,439, Cl. 260-176.000.

Ronel, Samuel H.: *See*—
Levy, Didya D.; and Ronel, Samuel H., 4,081,402, Cl. 252-428.000.

Roos, Sture Gosta: *See*—
Pehrson, Jens Erland; Roos, Sture Gosta; and Valastro, Bartolo, 4,081,662, Cl. 235-308.000.

Roper Corporation: *See*—
Torrey, Sumner Hale, 4,081,647, Cl. 219-10.55D.

Rorer Italiana S.p.A.: *See*—
Bertelli, Aldo, 4,081,541, Cl. 424-243.000.

Rorex, Robert L., to Kole Enterprises, Inc. Document filing assembly. 4,081,080, Cl. 211-55.000.

Roscamp, Thomas A.; Gibson, George W.; and Shelley, Pierre Anthony John Minton, to Applied Magnetics Corporation. Magnetic head-slider assembly. 4,081,846, Cl. 360-103.000.

Rosemount Engineering Company Limited: *See*—
Johnston, James Stewart, 4,080,821, Cl. 73-27.00R.

Rosen, Arye: *See*—
Klatskin, Jerome Barnard; and Rosen, Arye, 4,080,722, Cl. 29-580.000.

Rosenacker, Arthur F., to Consolidated Foods Corporation. Display cart assembly. 4,081,205, Cl. 312-250.000.

Rosenkranz, Hans Jurgen: *See*—
Traenckner, Hans-Joachim; Fuhr, Karl; Rosenkranz, Hans Jurgen; Patheiger, Manfred, deceased; and Rudolph, Hans, 4,081,492, Cl. 260-837.00R.

Rosenmund AG: *See*—
Rosenmund, Peter; and Brodbeck, Hans, 4,081,381, Cl. 210-408.000.

Rosenmund, Peter; and Brodbeck, Hans, to Rosenmund AG. Filtering apparatus. 4,081,381, Cl. 210-408.000.

Rosinski, Edward J.: *See*—
Plank, Charles J.; Rosinski, Edward J.; and Rubin, Mae K., 4,081,490, Cl. 260-673.000.

Ross, Frank E., to Maytag Company, The. Caster brake control system. 4,080,809, Cl. 68-12.00R.

Roth, Leo; and Roth, Ursula. Manually programmable card selector apparatus. 4,081,079, Cl. 209-110.500.

Roth, Paul. Device for cutting pieces of predetermined length from endless, strand-form material. 4,080,857, Cl. 83-241.000.

Roth, Ursula: *See*—
Roth, Leo; and Roth, Ursula, 4,081,079, Cl. 209-110.500.

Routien, John B.: *See*—
Celmer, Walter D.; Cullen, Walter P.; Moppett, Charles E.; Routien, John B.; Jefferson, Mark T.; Shibakawa, Riichiro; and Tone, Junsuke, 4,081,532, Cl. 424-122.000.

Rowley, Paul M.: *See*—
Stearley, John W.; Rowley, Paul M.; and Buckshaw, Thomas M., 4,081,637, Cl. 200-83.0WM.

Rozniecki, Edward J., to United States of America, Army. Mechanism for exhausting impurities from engine fuel. 4,081,373, Cl. 210-114.000.

Rubin, Mae K.: *See*—
Plank, Charles J.; Rosinski, Edward J.; and Rubin, Mae K., 4,081,490, Cl. 260-673.000.

Rucker Company, The: *See*—
Nguyen, Thomas X. T., 4,081,027, Cl. 166-55.000.

Rudakov, Alexei Dmitrievich: *See*—
Repolovsky, Alexandr Ivanovich; Pakhter, Ilya Kharitonovich; Rudakov, Alexei Dmitrievich; Baranov, Alexandr Nikolaevich; Gliner, Leonid Efimovich; Gapoian, Dmitry Trdatovich; and Tumasiants, Igor Veniaminovich, 4,080,875, Cl. 92-29.000.

Rudd, Thomas H.: *See*—
Paniri, Zvi; and Rudd, Thomas H., 4,081,602, Cl. 174-103.000.

Rudd, Wallace C.; and Udall, Humfrey N., to Thermatool Corporation. High frequency in-line, electrical welding apparatus for small diameter metal tubing. 4,081,648, Cl. 219-59.100.

Rudolph, Hans: *See*—
Traenckner, Hans-Joachim; Fuhr, Karl; Rosenkranz, Hans Jurgen; Patheiger, Manfred, deceased; and Rudolph, Hans, 4,081,492, Cl. 260-837.00R.

Ruhaak, Donald J. Batter board. 4,080,739, Cl. 33-86.000.

Rumbaugh, Paul S., to Altec Corporation. Parallel power amplifier circuits. 4,081,757, Cl. 330-124.00R.

Rush, William F.; Wurm, Jaroslav; and Dufour, Raymond J., to Gas Developments Corporation. Air conditioning apparatus and method. 4,081,024, Cl. 165-62.000.

Ruti Machinery Works Ltd.: *See*—
Wollenmann, Hans Peter, 4,081,000, Cl. 139-435.000.

Ryabikova, Julia Nikitichna: *See*—
Vetrov, Boris Danilovich; Kiselev, Boris Eliseevich; Kostjukovich, Vladimir Ivanovich; Mikhailovsky, Leonid Nikolaevich; Ryabikova, Julia Nikitichna; and Trofimov, Viktor Ivanovich, 4,080,697, Cl. 29-33.00K.

Ryba, Anton, to AUVE Patentverwertungsgesellschaft mit beschrankter Haftung. Automatically actuatable fan clutch, in particular for cooling systems for internal combustion engines. 4,081,066, Cl. 192-82.00T.

Rysti, Alpo. Method and apparatus for handling articles of different types. 4,081,088, Cl. 214-6.00M.

S.R.M. Hydromekanik: *See*—
Ahlen, Karl Gustav, 4,080,786, Cl. 60-361.000.

Saab-Scania Aktiebolag: *See*—
Ideskar, Willie Ake, 4,081,156, Cl. 244-122.0AG.

Saari, Walfred S.: *See*—
Lumma, William C., Jr.; and Saari, Walfred S., 4,081,542, Cl. 424-250.000.

Sack, Stanley F.; and Mattuck, Morris, to Canadian General Electric Company, Ltd. Dry well fuseholder. 4,081,778, Cl. 337-186.000.

Sailer, Andre Louis: *See*—
Frank, Pierre; and Sailer, Andre Louis, 4,081,437, Cl. 260-159.000.

Sakai, Hiroshi; Takeuchi, Yoshihiko; and Kurisu, Shizuka, to Teijin Limited. Process for preparing soft transparent polyether polyester block copolymers. 4,081,494, Cl. 260-860.000.

Sakai, Yoshiharu, to Nihon Radiator Co., Ltd. Cap for fuel tank. 4,081,102, Cl. 220-203.000.

Sakharov, Boris Alexandrovich: *See*—
Borodin, Valerian Alexeevich; Onikov, Eduard Arshakovich; Sakharov, Boris Alexandrovich; Zabotin, Alexandr Alexandrovich; Loschilin, Evgeny Dmitrievich; and Galperin, Alexandr Lvovich, 4,081,001, Cl. 139-436.000.

Sakurada, Nobuaki: *See*—
Kawamura, Masaharu; Sakurada, Nobuaki; Ito, Tadashi; Murakami, Hiroyashu; Ito, Fumio; and Shinoda, Nobuhiko, 4,081,813, Cl. 354-289.000.

Salemka, Robert M.: *See*—
Bauer, Dan O.; and Salemka, Robert M., 4,080,873, Cl. 91-446.000.

Salmon, Jean P.: *See*—
Devy, Robert C.; and Salmon, Jean P., 4,081,160, Cl. 246-63.00C.

Salzmann, Jean-Jacques: *See*—
Benguerel, Francois; and Salzmann, Jean-Jacques, 4,081,438, Cl. 260-160.000.

Sam Stein Associates, Inc.: *See*—
Deal, Douglas O.; and Miller, Michael E., 4,081,375, Cl. 210-122.000.

Sand, Edward Charles; and Lightner, Harold C., to Ardac, Inc. Tray acceptor apparatus. 4,081,131, Cl. 235-419.000.

Sand, Leonard B.; and Dodwell, Glenn W., to Zeochem Corporation. Process for producing fluidized mordenite particles. 4,081,514, Cl. 423-328.000.

Sander, Theo: *See*—
Laue, Karl Heinrich; Sander, Theo; Sauder, Peter; and Uckert, Gotthard, 4,081,511, Cl. 423-239.00A.

Sanders, James Milton: *See*—
Sprecker, Mark A.; Vock, Manfred Hugo; Schmitt, Frederick Louis; Hall, John B.; and Sanders, James Milton, 4,081,481, Cl. 260-586.00R.

Sandow, Kiyoshi, to Plasteco, Inc. Adjustable volume setting mechanism for repeatable fluid discharge device. 4,081,111, Cl. 222-309.000.

Sandoz, Inc.: *See—*
Anderson, Paul L.; and Brittain, Darryl A., 4,081,476, Cl. 560-255.000.

Sandoz Ltd.: *See—*
Bastian, Jean-Michel, 4,081,543, Cl. 424-258.000.
Benguerel, Francois; and Salzmann, Jean-Jacques, 4,081,438, Cl. 260-160.000.

Sandstrom, Wayne R. Portable solar energy collector. 4,080,955, Cl. 126-271.000.

Sangesland, Odd E.: *See—*
Edelstein, Fred; Haslett, Robert A.; and Sangesland, Odd E., 4,081,023, Cl. 165-53.000.

Sanyo Electric Co., Ltd.: *See—*
Sumi, Yasuaki, 4,081,752, Cl. 325-335.000.

Sapunar, Zakhar Isaevich: *See—*
Glikman, Mark Leonovich; Tjurin, Jury Mikhailovich; Gorshkov, Gennady Nikolaevich; Gorokhovsky, Vladilen Alexandrovich; Shabanov, Alexei Georgievich; Sapunar, Zakhar Isaevich; Avrus, Albert Vladimirovich; and Fainberg, Evgeny Borisovich, 4,081,260, Cl. 65-25.00A.

Sarantakis, Dimitrios, to American Home Products Corporation. D-Nle^4-somatostatin and analogues thereof. 4,081,433, Cl. 260-112.50S.

Sato, Tadashi: *See—*
Chibata, Ichiro; Tosa, Tetsuya; and Sato, Tadashi, 4,081,327, Cl. 195-31.00F.

Sauder, Peter: *See—*
Laue, Karl Heinrich; Sander, Theo; Sauder, Peter; and Uckert, Gotthard, 4,081,511, Cl. 423-239.00A.

Saurer-Allma GmbH Allgauer Maschinenbau: *See—*
Hemala, Zdenek; Nudinger, Gunter; Wehrmeister, Gerhard; Mair, Reinhard; and Wurster, Erich, 4,080,776, Cl. 57-34.00R.

Savard, Hassel J., Jr., to Atron, Inc. Apparatus for applying and adhering particulate thermoplastic materials to supporting substrates. 4,080,928, Cl. 118-59.000.

Savoie, Hilbert Joseph, Jr. Diving gas recovery apparatus. 4,080,964, Cl. 128-142.300.

Savor, Dennis Edward: *See—*
Barger, John Joseph; Blevins, Milton Lee; and Savor, Dennis Edward, 4,081,650, Cl. 219-60.00A.

Sawhill, James W., to Marten, Roger, a part interest. Preservation of whey. 4,081,555, Cl. 426-2.000.

Sawyer, Willard H., to Exxon Research & Engineering Co. Preparation of catalysts of predetermined pore size distribution and pore volume. 4,081,405, Cl. 252-455.00R.

Sawyer, Willard H., to Exxon Research & Engineering Co. Preparation of catalysts of predetermined pore size distribution and pore volume. 4,081,406, Cl. 252-455.00R.

SBT Development Corporation: *See—*
Freitag, Werner F. J., 4,080,921, Cl. 114-249.000.

Scattergood, Roger: *See—*
Swinney, Brian; and Scattergood, Roger, 4,081,389, Cl. 252-52.00R.

Schaffeler, Alois, to J. & J. Marquardt, Firma. Cam operated switch having wavy spring contact assembly abutting stop or fixed contact thereby storing kinetic energy prior to subsequent engagement with a fixed contact assembly. 4,081,632, Cl. 200-6.0BB.

Schanze, Klaus: *See—*
Vetter, Lothar; Forster, Karl-Heinz; and Schanze, Klaus, 4,081,723, Cl. 318-38.000.

Scharer, Samuel, to BEGA A.G. Safety seat belt locking device for vehicles. 4,081,052, Cl. 180-82.00C.

Scharpf, William George, to FMC Corporation. Process for preparing 1,1-dihalo-4-methyl-1,3-pentadienes. 4,081,488, Cl. 260-654.00R.

Schelfaut, Francois Leon: *See—*
Corluy, Hans Josephus; Schelfaut, Francois Leon; Nys, Pierre Herman; and Bortels, Raoul Jan, 4,081,280, Cl. 96-50.00A.

Schellhase, Frank A.: *See—*
MacSpadden, Floyd E.; Schellhase, Frank A.; Strong, Robert L.; and Tieden, Jansey D., 4,081,734, Cl. 318-645.000.

Schempp, Eberhard G.: *See—*
Nomine, Harold; and Schempp, Eberhard G., 4,081,269, Cl. 75-60.000.

Scherer, George: *See—*
Sperber, Martin; Eggerts, Ragnars Martin; and Scherer, George, 4,081,839, Cl. 358-186.000.

Schering Aktiengesellschaft: *See—*
Hofmeister, Helmut; Wiechert, Rudolf; Annen, Klaus; Laurent, Henry; and Steinbeck, Hermann, 4,081,537, Cl. 424-238.000.

Schering Corporation: *See—*
Mayer, Joseph, 4,081,451, Cl. 260-295.50R.
Neustadt, Bernard R., 4,081,547, Cl. 424-272.000.
Steinman, Martin, 4,081,549, Cl. 424-275.000.
Walter, Lewis A., 4,081,544, Cl. 424-263.000.

Scherrer, Charles L.; and Baughman, Don L., to McConway & Torley Corporation. Coupler shank hard facing. 4,081,082, Cl. 213-62.00A.

Schimmel, Karl F.; Pierce, Percy E.; and Jones, James E., to PPG Industries, Inc. Process for cationic electrodeposition. 4,081,343, Cl. 204-181.00C.

Schleich, Kuno; and Stoller, Hansjorg, to Hoffman-La Roche Inc. Manufacture of polyene compounds via a Wittig reaction in a two phase solvent system. 4,081,470, Cl. 260-410.90R.

Schmidt, Harvey E.; Henry, Luke F.; Murphy, Howard G.; and Gilmore, Thomas P., to Allis-Chalmers Corporation. Lift truck control providing time delay in operation of directional contactor. 4,081,725, Cl. 318-139.000.

Schmidtberger, Rudolf: *See—*
Porzsolt, Franz; Tautz, Christoph; Schmidtberger, Rudolf; Ax, Wolfgang; and Enders, Burkhard, 4,081,241, Cl. 23-230.00B.

Schmitt, Frederick Louis: *See—*
Hall, John B.; Sprecker, Mark A.; Schmitt, Frederick Louis; and Vock, Manfred Hugo, 4,081,479, Cl. 260-586.00R.
Sprecker, Mark A.; Vock, Manfred Hugo; Schmitt, Frederick Louis; Hall, John B.; and Sanders, James Milton, 4,081,481, Cl. 260-586.00R.

Schmitt, Joseph Lawrence, Jr.; Waker, Philip Leroy, Jr.; and Castellion, George Augustus, to American Cyanamid Company. Use of carbon particulates with controlled density as adsorbents. 4,081,370, Cl. 210-39.000.

Schnurr, Robert H.: *See—*
Williams, Clark R., deceased; and Schnurr, Robert H., 4,080,780, Cl. 58-50.00R.

Schoenfeld, Richard A.: *See—*
Delente, Jacques J.; and Schoenfeld, Richard A., 4,081,432, Cl. 260-112.00B.

Schoepe, Adolf. Ball cock float having improved anti-noise structure. 4,080,986, Cl. 137-432.000.

Scholten, Joseph J. F.; and Koks, Hendrik L. T., to Stamicarbon, B.V. Separation of catalyst particles from a suspension of these particles in an aqueous hydroxyl-ammonium salt solution. 4,081,516, Cl. 423-387.000.

Schon, Manfred: *See—*
Michel, Walter; Honel, Hans; and Schon, Manfred, 4,081,426, Cl. 260-67.60R.

Schrag, Robert L.; Long, Harold A.; and Harvey, Robert T., to NCR Corporation. Internal vibration dampening means for printing mechanism. 4,081,067, Cl. 197-1.00R.

Schrock, Wilfried: *See—*
Konig, Hans-Bodo; Metzger, Karl Georg; and Schrock, Wilfried, 4,081,539, Cl. 424-246.000.

Schroeder, Guenter: *See—*
Gruber, Wilhelm; and Schroeder, Guenter, 4,081,465, Cl. 260-526.00N.

Schuessler, John C.; and Tapp, David J., to Leach Corporation. Moving contact terminals for relays. 4,081,772, Cl. 335-200.000.

Schultz, Helmut: *See—*
Ender, Gunter; Schultz, Helmut; Thiele, Hartmut; Gruber, Leo; Kober, Heinrich; Bottcher, Werner; and Macheiner, Tibor, 4,081,151, Cl. 242-68.500.

Schulze, Martin: *See—*
Preusser, Gerhard; Schulze, Martin; Richter, Klaus; and Huwels, Wilhelm, 4,081,355, Cl. 208-313.000.

Schumann, Gunter Hellmut: *See—*
Bohme, Dietrich; Schumann, Gunter Hellmut; Hahn, Gunter; and Jung, Rolf, 4,081,671, Cl. 250-202.000.

Schussler, Hans; Wulf, Hans-Jurgen; Rall, Bernhard; and Knapp, Helmut, to Licentia Patent-Verwaltungs-G.m.b.H. Monolithically integrated semiconductor circuit arrangement. 4,081,792, Cl. 340-166.00R.

Schwartz, Robert E.: *See—*
Zink, John S.; Reed, Robert D.; and Schwartz, Robert E., 4,080,883, Cl. 98-58.000.

Scott Bonnar Limited: *See—*
Knight, Roy George, 4,080,774, Cl. 56-199.000.

Seal Incorporated: *See—*
Merrill, Richard E.; and Krueger, Theodore H., 4,081,282, Cl. 96-77.000.

Searle, Eric Henry, to Dunlop Limited. Pneumatic tire and wheel rim assemblies. 4,081,014, Cl. 152-330.00L.

SEB S.A.: *See—*
Pauty, Bernard, 4,080,885, Cl. 99-501.000.

Seckendorf, Bernard A. Camera. 4,081,806, Cl. 354-121.000.

Seidel, Harold, to Bell Telephone Laboratories, Incorporated. Apparatus for supplementing commercial power subject to brownout and blackout failures. 4,081,692, Cl. 307-64.000.

Seifert, Peter; Chupka, David E.; Getz, Lynn L.; Hatton, Derald R.; Thomas, R. Marvin; Osso, John M.; and Rogl, Herbert A., to Black Clawson Company, The. Reversible disk refiner plates. 4,081,147, Cl. 241-261.300.

Seiko Koki Kabushiki Kaisha: *See—*
Onda, Eiichi; and Watanabe, Masanori, 4,081,810, Cl. 354-246.000.

Sekisui Kaseihin Kogyo Kabushiki Kaisha: *See—*
Yaita, Masato, 4,081,225, Cl. 425-4.00R.

Sekiya, Setsuro: *See—*
Noguchi, Masaaki; Tanaka, Yukiyasu; Sekiya, Setsuro; and Motosugi, Katsuhiko, 4,080,938, Cl. 123-75.00B.

Selin, Clifford E.; and Proell, Wayne A., to American Hydrocarbon Company. Gaseous product stream. 4,081,518, Cl. 423-400.000.

Sensor Technology, Inc.: *See—*
Chitre, Sanjeev R., 4,081,820, Cl. 357-30.000.

Sentrol Systems Ltd.: *See—*
Buchnea, Alexander, 4,081,676, Cl. 250-272.000.

Sestanj, Kazimir: *See—*
Immer, Hans U.; Nelson, Verner R.; and Sestanj, Kazimir, 4,081,530, Cl. 424-177.000.

Shabanov, Alexei Georgievich: *See—*
Glikman, Mark Leonovich; Tjurin, Jury Mikhailovich; Gorshkov, Gennady Nikolaevich; Gorokhovsky, Vladilen Alexandrovich; Shabanov, Alexei Georgievich; Sapunar, Zakhar Isaevich; Av-

rus, Albert Vladimirovich; and Fainberg, Evgeny Borisovich, 4,081,260, Cl. 65-25.00A.

Shaftner, Robert F.: *See—*
Briggs, Eugene C.; Wellbaum, William C.; and Shaftner, Robert F., 4,081,238, Cl. 432-222.000.

Shallenberger, John M.; Hornak, Leonard P.; and Desmarchais, Walter E., to Westinghouse Electric Corporation. Handling apparatus for a nuclear reactor fuel assembly. 4,081,086, Cl. 214-2.000.

Shanoski, Henry: *See—*
van Essen, Willem J.; Shanoski, Henry; and Griffith, Richard M., 4,081,578, Cl. 428-63.000.

Sharma, Mahindar N.: *See—*
White, Eugene B.; and Sharma, Mahindar N., 4,081,365, Cl. 210-3.000.

Sharp Kabushiki Kaisha: *See—*
Washizuka, Isamu; and Hashimoto, Shintaro, 4,081,664, Cl. 364-705.000.

Shay, Joseph Leo: *See—*
Bachmann, Klaus Jurgen; Buehler, Ernest; Shay, Joseph Leo; and Wagner, Sigurd, 4,081,290, Cl. 136-89.0TF.

Shead, Terence H. C., to Worldwide Plastics Development Limited. Collapsible container. 4,081,099, Cl. 220-6.000.

Shearon, Michael Hillas, to Du Pont de Nemours, E. I., and Company. Rotary web chopper. 4,080,856, Cl. 83-99.000.

Shell Oil Company: *See—*
Bauer, Ronald S., 4,081,491, Cl. 260-834.000.
Gergen, William P.; and Davison, Sol, 4,081,424, Cl. 260-42.180.
McNicol, Brian D.; and Short, Richard T., 4,081,409, Cl. 252-472.000.
Nanny, Walter C., 4,080,799, Cl. 61-110.000.

Shelley, Pierre Anthony John Minton: *See—*
Roscamp, Thomas A.; Gibson, George W.; and Shelley, Pierre Anthony John Minton, 4,081,846, Cl. 360-103.000.

Shen, Kwan Ting; and Pickering, Timothy L., to Ciba-Geigy Corporation. Process for preparing water-dilutable, heat-curing coating compositions. 4,081,417, Cl. 260-29.2EP.

Sherman, Clarence A., to McDermid, Terry. Lock valve for double acting cylinder. 4,081,053, Cl. 180-89.150.

Sherman, Herbert, to Pay Television Corporation. Pay television system, method and apparatus. 4,081,832, Cl. 358-124.000.

Shibakawa, Riichiro: *See—*
Celmer, Walter D.; Cullen, Walter P.; Moppett, Charles E.; Routien, John B.; Jefferson, Mark T.; Shibakawa, Riichiro; and Tone, Junsuke, 4,081,532, Cl. 424-122.000.

Shibuya-Kogya Company, Ltd.: *See—*
Ono, Hiroshi, 4,081,069, Cl. 198-384.000.

Shichman, Daniel; Percarpio, Peter E.; and Black, Sheppard A., to Uniroyal, Inc. Bead grip ring. 4,081,310, Cl. 156-398.000.

Shigeta, Yoshihiro; and Takahashi, Kiyoshi, to Canon Kabushiki Kaisha. Processing condition control system for a multi-purpose film handling cartridge. 4,081,211, Cl. 352-130.000.

Shikaya, Yukihiro, to Dai Nippon Printing Company Limited. Method for preparation of cylindrical corrugated article. 4,080,880, Cl. 93-94.00R.

Shiloni, Mordechay. Device for compacting trash and the like. 4,080,889, Cl. 100-52.000.

Shimada, Osamu; and Takahashi, Katsumasa, to Sony Corporation. Rotary head assembly. 4,081,847, Cl. 360-107.000.

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Uyeo, Shoichiro; Itani, Hikaru; Aoki, Tsutomu; Tsuji, Teruji; and Nagata, Wataru, 4,081,443, Cl. 260-239.100.

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Queen, David Stewart; Bell, Peter William; Dick, Thomas Hutcheson; and Edgar, John Black, 4,081,579, Cl. 428-95.000.

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Eckstein, Paul; Jantsch, Ottomar; and Reimann, Bernd, 4,080,830, Cl. 73-719.000.
Fleer, Ernst Otto, 4,080,737, Cl. 32-22.000.
Golser, Hans; and Kindl, Helmut, 4,081,762, Cl. 331-94.50G.
Losehand, Helmut, 4,081,619, Cl. 179-90.00K.
Markwitz, Wernhard, 4,081,789, Cl. 340-146.1AQ.
Martens, Hans; and Hillenbrand, Bernhard, 4,081,573, Cl. 427-62.000.
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Rockl, Friedrich; Stocker, Helmut; and Braumann, Gundokar, 4,081,775, Cl. 335-271.000.

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Skoultchi, Martin M., to National Starch and Chemical Corporation. Rapid curing two part adhesives. 4,081,308, Cl. 156-310.000.

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Smirl, Richard L., to Borg-Warner Corporation. Automotive transmission. 4,080,848, Cl. 74-759.000.

Smith, Carlyle F., Jr., to General Electric Company. Method of making

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Appleby, Paul E.; Brinkley, Max D.; and Smith, Clement C., 4,081,017, Cl. 157-13.000.
Smith, Edward A., to Advanced Filtration Equipment Corporation. Filter bag arrangement for a pressure vessel and method of manufacture thereof. 4,081,379, Cl. 210-232.000.
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Smith, Gary L.; and Reese, Dennis Eugene, to O. M. Scott & Sons Company, The. Certain 3,5-dihalo-1,2,4-thiadiazole preparations. 4,081,453, Cl. 260-302.00D.
Smith, Grant H.; and Hayter, John C., to Borg-Warner Corporation. Drive connection for the pressure plate of a friction clutch. 4,081,064, Cl. 192-70.130.
Smith, Peter: *See*—
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Smith, Ronald D.; Frankel, Steven B.; Reeher, John R.; and Story, Michael S., to Finnigan Corporation. Combined vacuum baffle and valve for diffusion pump. 4,081,222, Cl. 417-153.000.
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Societa ' Ascensori Italiani Riuniti-S.A.I.R. Falconi-S.A.F.O.V. - S.p.A.: *See*—
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Societa Italiana Telecomunicazioni SIEMENS S.p.A.: *See*—
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Societe Alsacienne de Constructions Mechaniques de Mulhouse: *See*—
Weber, Roger; and Lotte, Andre, 4,080,894, Cl. 101-128.100.
s.a. Texaco Belgium n.v.: *See*—
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Societe d'Assistance Technique pour Produits Nestle S.A.: *See*—
Bracco, Umberto, 4,081,568, Cl. 426-584.000.
Horisberger, Marc; Sozzi, Tomaso; and Pousaz, Robert, 4,081,330, Cl. 195-66.00R.
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Societe Generale de Constructions Electriques et Mecaniques Alsthom S.A.: *See*—
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Societe Industrielle et Commerciale de Transformation des Plastiques "Sicopal": *See*—
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Sony Corporation: *See*—
Aoki, Teruaki; Matsushita, Takeshi; Mifune, Tadayoshi; and Abe, Motoaki, 4,081,292, Cl. 148-1.500.
Nikami, Akira; and Kuriki, Choei, 4,081,728, Cl. 318-318.000.
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Murtland, William H., 4,081,730, Cl. 318-584.000.
Price, Robert; Jacoby, George V.; and Geffon, Arthur P., 4,081,756, Cl. 328-117.000.
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Spirig, Ernst. Method of flux coating metal wick. 4,081,575, Cl. 427-327.000.
Spitzer, Robert. Electrolytic production of hydrogen. 4,081,337, Cl. 204-129.000.
Spivack, John D., to Ciba-Geigy Corporation. Trialkylsubstituted hydroxybenzyl malonates and stabilized compositions. 4,081,475, Cl. 560-55.000.
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Stapley, Edward O.: *See*—
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Stolle, William H.; and Tiegel, Ralph G., to Tiegel Manufacturing Company. Battery plate envelope machine and method of making battery plate envelopes. 4,080,727, Cl. 29-623.400.
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Stone, Gordon R. Vehicular propulsion system. 4,081,693, Cl. 307-66.000.
Stone, Lawrence J., to Massey-Ferguson Inc. Drive train support for an articulated vehicle. 4,081,046, Cl. 180-14.00B.
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Leenhouts, Albert C.; and Singh, Gurdial, 4,081,736, Cl. 318-696.000.
Sutton, Joel F.; Mattson, Allen R.; and Anders, Larry E., to United States of America, Air Force. Finned surface cooled nozzle. 4,081,137, Cl. 239-127.300.
Suzuki, Fukutaro. Jewelry article with selectively visible portions. 4,080,803, Cl. 63-15.400.
Suzuki, Shuichi; Aizawa, Masuo; Ishigur, Isao; Shinohara, Rikio; and Nagamura, Yoichi, to Nippon Chemiphar Co., Ltd. Antigen membranes for use in syphilis diagnosis and syphilis diagnosis apparatus using such membranes. 4,081,334, Cl. 204-1.00T.
Suzuki, Yuji: *See*—
Kazama, Yoshiteru; Suzuki, Yuji; Sumida, Yuzo; Hiraoka, Tatsuo; and Miura, Yasuo, 4,081,493, Cl. 260-859.0PV.
Swart, Franz J.: *See*—
Malmros, Edward T.; and Swart, Franz J., 4,081,063, Cl. 192-56.00F.
Sweeney, Richard F.: *See*—
Anello, Louis G.; Sweeney, Richard F.; and Sukornick, Bernard, 4,081,487, Cl. 260-653.400.
Swindell, William; and Barrett, Harrison H., to University Patents, Inc. Transverse tomography apparatus and method. 4,081,673, Cl. 250-237.00R.
Swindells, Richard; and Fredette, Maurice C. J., to Erco Industries Limited. High efficiency production of chlorine dioxide by solvay process. 4,081,520, Cl. 423-478.000.
Swinney, Brian; and Scattergood, Roger, to Exxon Research & Engineering Co. Lubricant composition containing a triketone. 4,081,389, Cl. 252-52.00R.
Swiss Aluminium Ltd.: *See*—
Ames, Adolf; and Theler, Jean-Jacques, 4,080,816, Cl. 72-253.00R.
Yarwood, John C.; Dore, James E.; and Preuss, Robert K., 4,081,371, Cl. 210-69.000.
Synestructics, Inc.: *See*—
Pearce, Peter J., 4,081,158, Cl. 244-153.00R.
Systron-Donner Corporation: *See*—
Marquess, Richard Donovan, 4,080,835, Cl. 73-517.00B.
Szolnay, Eva: *See*—
Csom, Gyula; Desi, Sandor; Szolnay, Eva; Gyurkocza, Csaba; Szucs, Imre; Varbiro, Vilmos; Elo, Sandor; and Benedek, Sandor, 4,081,683, Cl. 250-364.000.
Szucs, Imre: *See*—
Csom, Gyula; Desi, Sandor; Szolnay, Eva; Gyurkocza, Csaba; Szucs, Imre; Varbiro, Vilmos; Elo, Sandor; and Benedek, Sandor, 4,081,683, Cl. 250-364.000.
Szwartz, Henry S., to Raymond Lee Organization, Inc., The, a part interest. Storm door and screen combination for a garage. 4,081,018, Cl. 160-113.000.
Tabron, Prymas M. Fire alarm deterrent. 4,081,796, Cl. 340-304.000.
Tada, Masahiro; Sumi, Takao; Hongu, Masayuki; and Ishigaki, Yoshio, to Sony Corporation. Undesired signal canceller. 4,081,837, Cl. 358-167.000.
Tagami, Eijiro: *See*—
Akiyama, Toyomi; Higaki, Taiji; Shiratsuchi, Eiichiro; and Tagami, Eijiro, 4,081,583, Cl. 428-457.000.
Akiyama, Toyomi; Higaki, Taiji; Shiratsuchi, Eiichiro; and Tagami, Eijiro, 4,081,584, Cl. 428-514.000.
Tai, Seiji: *See*—
Abe, Mitsuo; Murata, Tetsuo; Furuichi, Minoru; Shiraishi, Nobuhide; Wada, Shohei; Tai, Seiji; and Maeda, Tsukasa, 4,081,414, Cl. 260-23.70R.
Tait, William C.: *See*—
Christmann, Marvin H.; Weiher, Richard L.; and Tait, William C., 4,081,764, Cl. 331-94.50H.
Takahashi, Akira, to Ricoh Co., Ltd. Apparatus for displaying the amount of exposure in a single lens reflex camera using an electronic shutter. 4,081,805, Cl. 354-60.00L.
Takahashi, Katsumasa: *See*—
Shimada, Osamu; and Takahashi, Katsumasa, 4,081,847, Cl. 360-107.000.

Takahashi, Kiyoshi: *See*—
Shigeta, Yoshihiro; and Takahashi, Kiyoshi, 4,081,211, Cl. 352-130.000.
Takaki, Usaji: *See*—
Tsumura, Ryuichirou; Takaki, Usaji; and Abe, Takeshi, 4,081,472, Cl. 260-453.00P.
Takamiya, Tadashi; and Yumde, Yasufumi, to Hitachi, Ltd. System for compensating jitter of video signal. 4,081,834, Cl. 358-158.000.
Takegami, Shinsuke; Korenaga, Takashi; and Yoshinaga, Chiharu, to Japan Exlan Company Limited. Process for producing adsorbent. 4,081,401, Cl. 252-428.000.
Takegami, Shinsuke; Korenaga, Takashi; and Yoshinaga, Chiharu, to Japan Exlan Company Limited. Adsorbent for the treatment of waste water. 4,081,403, Cl. 252-428.000.
Takenaka, Ahinji: *See*—
Yamamoto, Kousuke; Takenaka, Ahinji; and Maeda, Kazuo, 4,081,521, Cl. 423-515.000.
Takeuchi, Yoshihiko: *See*—
Sakai, Hiroshi; Takeuchi, Yoshihiko; and Kurisu, Shizuka, 4,081,494, Cl. 260-860.000.
Takiyama, Eiichiro; Sugimoto, Toshiaki; Yamaguchi, Goichi; and Nagao, Susumu, to Showa Highpolymer Co., Ltd.; and Nippon Kayaku Kabushiki Kaisha. Method for stabilizing unsaturated cycloacetal resin. 4,081,591, Cl. 526-217.000.
Talley, Charles Bullick, to Pennwalt Corporation. Alkaline detergent compositions. 4,081,395, Cl. 252-106.000.
Tamborski, Christ, to United States of America, Air Force. Fluoroalkyleneether difunctional compounds. 4,081,473, Cl. 260-453.0RW.
Tamura, Hifumi; Ishitani, Tohru; and Hirano, Tokuro, to Hitachi, Ltd. Ion microprobe analyzer. 4,081,674, Cl. 250-251.000.
Tan, Gim; and Gatsis, John G., to UOP Inc. Process for the liquefaction of coal and separation of solids from the liquid product. 4,081,358, Cl. 208-8.000.
Tan, Gim; and Gatsis, John G., to UOP Inc. Method for suppressing asphaltene formation during coal liquefaction and separation of solids from the liquid product. 4,081,360, Cl. 208-8.000.
Tan, Gim: *See*—
Gatsis, John G.; and Tan, Gim, 4,081,359, Cl. 208-8.000.
Tan, Yoichi: *See*—
Yamamoto, Masami; Yamazaki, Fumiaki; Hosoda, Akira; Hashimoto, Hiromi; and Tan, Yoichi, 4,081,790, Cl. 340-146.1BE.
Tanabe Seiyaku Co., Ltd.: *See*—
Chibata, Ichiro; Tosa, Tetsuya; and Sato, Tadashi, 4,081,327, Cl. 195-31.00F.
Tanaka, Akira; and Ulrich, Charles, to American Safety Equipment Corporation. Safety belt tensioning and rewinding retractor. 4,081,153, Cl. 242-107.000.
Tanaka, Yuji: *See*—
Hamatani, Fumikazu; Ichikawa, Mikihiro; and Tanaka, Yuji, 4,081,625, Cl. 179-99.000.
Tanaka, Yukiyasu: *See*—
Noguchi, Masaaki; Tanaka, Yukiyasu; Sekiya, Setsuro; and Motosugi, Ka'suhiko, 4,080,938, Cl. 123-75.00B.
Tang, Danny Q. H.; and Yee, Bark L., to Twin County Trans-Video, Inc. High security subscription television system employing real time control of subscriber's program reception. 4,081,831, Cl. 358-114.000.
Tapp, David J.: *See*—
Schuessler, John C.; and Tapp, David J., 4,081,772, Cl. 335-200.000.
Tarui, Tadaaki: *See*—
Amemiya, Hiroshi; Tarui, Tadaaki; and Yoneyama, Tsuneo, 4,081,800, Cl. 340-347.0NT.
Tautz, Christoph: *See*—
Porzsolt, Franz; Tautz, Christoph; Schmidtberger, Rudolf; Ax, Wolfgang; and Enders, Burkhard, 4,081,241, Cl. 23-230.00B.
TDK Electronics Company, Limited: *See*—
Inoue, Mitio, 4,081,114, Cl. 224-5.00C.
Teach, Eugene G.: *See*—
Baker, Don R.; and Teach, Eugene G., 4,081,474, Cl. 260-456.00A.
Technex International Ltd.: *See*—
Clark, Jeremy, 4,081,617, Cl. 179-84.00T.
Clark, Jeremy; and Allen, Robert, 4,081,622, Cl. 179-81.00B.
Teckton, Inc.: *See*—
Goltsos, Costas E., 4,081,646, Cl. 219-10.55E.
Teco, Inc.: *See*—
Johnson, Leonard L., 4,081,055, Cl. 182-2.000.
Teijin Limited: *See*—
Sakai, Hiroshi; Takeuchi, Yoshihiko; and Kurisu, Shizuka, 4,081,494, Cl. 260-860.000.
Teledyne Industries, Inc.: *See*—
Hamburg, Glenn; and Jasas, Gytis, 4,080,783, Cl. 60-39.080.
Teledyne McCormick Selph: *See*—
Goddard, Terrence P.; Webb, Samuel D.; and Thatcher, Donald N., 4,080,902, Cl. 102-70.00R.
Telefonaktiebolaget L M Ericsson: *See*—
Pehrson, Jens Erland; Roos, Sture Gosta; and Valastro, Bartolo, 4,081,662, Cl. 235-308.000.
Templin, Alan S., to TRW Inc. Cermet etch technique. 4,081,315, Cl. 156-653.000.
Teratani, Tatsuo; and Kuroyanagi, Yoshitaka, to Toyota Jidosha Kogyo Kabushiki Kaisha. Vehicle alternator system with noise filter. 4,081,740, Cl. 322-28.000.
Terrell, Gerald K. Pie crust shield. 4,080,884, Cl. 99-433.000.
Texaco Development Corporation: *See*—
Marion, Charles P., 4,081,253, Cl. 48-197.00R.
Texaco Inc.: *See*—
Yamamoto, Roy I.; Cusano, Carmen M.; and Gaetani, Frank J., 4,081,385, Cl. 252-32.70E.
Texaco Trinidad Inc.: *See*—
Ali, Wahid R., 4,081,264, Cl. 71-28.000.
Texas Instruments Incorporated: *See*—
Bray, William Edward, 4,081,735, Cl. 318-696.000.
Linn, John Charles, 4,081,861, Cl. 365-2.000.
Shreve, William Robert, 4,081,769, Cl. 333-72.000.
White, Lionel S., Jr.; McAdams, Hugh P.; and Redwine, Donald J., 4,081,701, Cl. 307-355.000.
Williams, Clark R., deceased; and Schnurr, Robert H., 4,080,780, Cl. 58-50.00R.
Textron Inc.: *See*—
Moertel, George B., 4,080,691, Cl. 24-205.10R.
Thatcher, Donald N.: *See*—
Goddard, Terrence P.; Webb, Samuel D.; and Thatcher, Donald N., 4,080,902, Cl. 102-70.00R.
Theler, Jean-Jacques: *See*—
Ames, Adolf; and Theler, Jean-Jacques, 4,080,816, Cl. 72-253.00R.
Thermatool Corporation: *See*—
Rudd, Wallace C.; and Udall, Humfrey N., 4,081,648, Cl. 219-59.100.
Thiele, Hartmut: *See*—
Ender, Gunter; Schultz, Helmut; Thiele, Hartmut; Gruber, Leo; Kober, Heinrich; Bottcher, Werner; and Macheiner, Tibor, 4,081,151, Cl. 242-68.500.
Thokar, Henry Desmont: *See*—
Tichauer, Paul Arthur; Adams, James Stephen; and Thokar, Henry Desmont, 4,081,270, Cl. 75-60.000.
Thomas & Betts Corporation: *See*—
Kuo, Ted L. C., 4,081,643, Cl. 200-153.00G.
Thomas, Haydon C.; and Keen, Harry J., to Colt Industries Operating Corporation. Electronic measuring system with pulsed transducer. 4,081,801, Cl. 340-347.0AD.
Thomas International Corporation: *See*—
Wholahan, John Douglas, 4,080,861, Cl. 84-1.240.
Thomas, John P.: *See*—
Guinn, David C.; Haggard, Archie K.; and Thomas, John P., 4,081,084, Cl. 214-1.00P.
Guinn, David C.; Haggard, Archie K.; and Thomas, John P., 4,081,163, Cl. 248-2.000.
Thomas, R. Marvin: *See*—
Seifert, Peter; Chupka, David E.; Getz, Lynn L.; Hatton, Derald R.; Thomas, R. Marvin; Osso, John M.; and Rogl, Herbert A., 4,081,147, Cl. 241-261.300.
Thomas & Skinner, Inc.: *See*—
Cronk, Edward R., 4,080,725, Cl. 29-609.000.
Cronk, Edward R., 4,081,777, Cl. 336-165.000.
Thomas, William Morgan. Speed responsive planetary transmission. 4,080,847, Cl. 74-751.000.
Thomassen, Petrus: *See*—
Flaschar, Heinz; Kroll, Peter; Thomassen, Petrus; Kleinschmidt, Heinz; and Preun, Hugo, 4,080,994, Cl. 137-596.130.
Thompson, David S.; Prestley, John S., Jr.; and Spangler, Grant E., to Reynolds Metals Company. Avoiding type A luder lines in forming sheet made of an Al-Mg alloy. 4,081,294, Cl. 148-11.50A.
Thompson, Frederick H.: *See*—
Gall, Ralph J.; and Thompson, Frederick H., 4,081,317, Cl. 162-80.000.
Thompson, Gene D., to Exxon Production Research Company. Artificial ice pad for operating in a frigid environment. 4,080,797, Cl. 61-103.000.
Thompson, Robert B.; and Alers, George A., to Rockwell International Corporation. Method of measuring stress in a material. 4,080,836, Cl. 73-597.000.
Thompson, Ronald Austin, to Imperial Chemical Industries Limited. Preparation of polymers. 4,081,428, Cl. 260-75.00N.
Thompson, William S., to Elkhart Brass Mfg. Co., Inc. Fluid valve. 4,081,172, Cl. 251-93.000.
Thor Power Tool Company: *See*—
Jonsson, Gregg N., 4,081,037, Cl. 173-1.000.
Thorley, Graham Roy, to Transportation Design & Technology, Inc. Wheelchair lift. 4,081,091, Cl. 214-75.00R.
Thorn, William B.; and Tobelmann, Jonathan G., to Corning Glass Works. Level control with float actuated switch. 4,081,638, Cl. 200-84.00R.
Tice, Charles, to DeLaval Turbine Inc. Liquid-level float switch construction. 4,081,639, Cl. 200-84.00C.
Tichauer, Paul Arthur; Adams, James Stephen; and Thokar, Henry Desmont, to Union Carbide Corporation; and National Steel Corporation. Renitrogenation of basic-oxygen steels during decarburization. 4,081,270, Cl. 75-60.000.
TIE/Communications, Inc.: *See*—
Hamatani, Fumikazu; Ichikawa, Mikihiro; and Tanaka, Yuji, 4,081,625, Cl. 179-99.000.
Kerman, Stephen E.; and Tsutsumi, Fumio, 4,081,624, Cl. 179-99.000.
Tieden, Jansey D.: *See*—
MacSpadden, Floyd E.; Schellhase, Frank A.; Strong, Robert L.; and Tieden, Jansey D., 4,081,734, Cl. 318-645.000.
Tiegel Manufacturing Company: *See*—
Stolle, William H.; and Tiegel, Ralph G., 4,080,727, Cl. 29-623.400.
Tiegel, Ralph G.: *See*—
Stolle, William H.; and Tiegel, Ralph G., 4,080,727, Cl. 29-623.400.

Tietje, Karin Rosemarie: *See—*
Prasad, Raj Nandan; Stein, Herman Hal; and Tietje, Karin Rosemarie, 4,081,447, Cl. 260-288.00R.

Tilton, Robert L., to PPG Industries, Inc. Apparatus and method for cooling a glass ribbon forming chamber. 4,081,261, Cl. 65-65.00A.

Tinsley Wire Industries Limited: *See—*
Baldwin, Ernest, 4,081,159, Cl. 245-2.000.

Tire-Gator, Inc.: *See—*
Johnson, Albert O.; Holiman, William E.; and Buchanan, Stephen D., 4,081,143, Cl. 241-29.000.

Titanium Technology N.V.: *See—*
Dunn, Wendell E., Jr., 4,081,507, Cl. 423-74.000.

Tjurin, Jury Mikhailovich: *See—*
Glikman, Mark Leonovich; Tjurin, Jury Mikhailovich; Gorshkov, Gennady Nikolaevich; Gorokhovsky, Vladilen Alexandrovich; Shabanov, Alexei Georgievich; Sapunar, Zakhar Isaevich; Avrus, Albert Vladimirovich; and Fainberg, Evgeny Borisovich, 4,081,260, Cl. 65-25.00A.

Tobelmann, Jonathan G.: *See—*
Thorn, William B.; and Tobelmann, Jonathan G., 4,081,638, Cl. 200-84.00R.

Tokumitsu, Ichiro; Konuma, Hideo; Mochizuki, Shigeaki; Okada, Yoshio; Yasumoto, Hiroshi; and Yoshihiro, Isao, to Idemitsu Petrochemical Co., Ltd. Method for producing a high impact polystyrene. 4,081,497, Cl. 260-880.00R.

Tokuyama, Fumitake: *See—*
Skinner, Wilfred A.; and Tokuyama, Fumitake, 4,081,328, Cl. 195-62.000.

Tokyo Shibaura Electric Co., Ltd.: *See—*
Amemiya, Hiroshi; Tarui, Tadaaki; and Yoneyama, Tsuneo, 4,081,800, Cl. 340-347.0NT.
Hara, Hisashi, 4,081,817, Cl. 357-23.000.
Okano, Michiaki, 4,081,843, Cl. 358-294.000.

Tolg, Gunter; and Werner, Wido, to Max-Planck-Gesellschaft zur Foerderung der Wissenschaften e.V. Apparatus for determining small amounts of nitrogen. 4,081,345, Cl. 204-195.00T.

Tomaro, Patrick M., to Conair Corporation. Pulsating shower head. 4,081,135, Cl. 239-102.000.

Tone, Junsuke: *See—*
Celmer, Walter D.; Cullen, Walter P.; Moppett, Charles E.; Routien, John B.; Jefferson, Mark T.; Shibakawa, Riichiro; and Tone, Junsuke, 4,081,532, Cl. 424-122.000.

Tong, Duncan, to Playart Limited. Toy track section with electrical connector safety means. 4,081,133, Cl. 238-10.00F.

Tonkovich, Frank, to Allied Tube & Conduit Corporation. Seam roller for tube mill. 4,081,649, Cl. 219-61.100.

Toof, Milo Rockwood. Ligature means and a method of securing a reed in a wind instrument. 4,080,866, Cl. 84-383.00R.

Toro Company, The: *See—*
Hunter, Edwin J., 4,080,980, Cl. 137-218.000.

Torrance, Joseph. Footwear. 4,080,745, Cl. 36-50.000.

Torres, Julio C., to Fabcon International, Inc. Sugar clarifying composition. 4,081,288, Cl. 127-48.000.

Torrey, Sumner Hale, to Roper Corporation. Energy seal for a microwave oven. 4,081,647, Cl. 219-10.55D.

Tosa, Tetsuya: *See—*
Chibata, Ichiro; Tosa, Tetsuya; and Sato, Tadashi, 4,081,327, Cl. 195-31.00F.

Totta, Paul Anthony: *See—*
Koopman, Nicholas George; and Totta, Paul Anthony, 4,081,825, Cl. 357-81.000.

Tottori Sanyo Electric Co., Ltd.: *See—*
Sumi, Yasuaki, 4,081,752, Cl. 325-335.000.

Touchstone, Roy H. Brake adjustment device for converting double shoe clasp-type brake assembly to single shoe brake assembly. 4,081,060, Cl. 188-197.000.

Toyo Soda Manufacturing Co., Ltd.: *See—*
Shimizu, Akihiko; and Hayashi, Takao, 4,081,419, Cl. 260-29.6HN.

Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Noguchi, Masaaki; Tanaka, Yukiyasu; Sekiya, Setsuro; and Motosugi, Katsuhiko, 4,080,938, Cl. 123-75.00B.
Teratani, Tatsuo; and Kuroyanagi, Yoshitaka, 4,081,740, Cl. 322-28.000.

Traenckner, Hans-Joachim; Fuhr, Karl; Rosenkranz, Hans Jurgen; Patheiger, Manfred, deceased (by Patheiger, Hannelore, heir); and Rudolph, Hans, to Bayer Aktiengesellschaft. Hardenable coating compositions. 4,081,492, Cl. 260-837.00R.

Transportation Design & Technology, Inc.: *See—*
Thorley, Graham Roy, 4,081,091, Cl. 214-75.00R.

Tri-State Oil Tool Industries, Inc.: *See—*
Johnson, Gary R.; and Kammerer, Archer W., Jr., 4,081,042, Cl. 175-267.000.

Trixl, Georg, to Consecco A.G. Connecting arrangement. 4,080,768, Cl. 52-521.000.

Trofimov, Viktor Ivanovich: *See—*
Vetrov, Boris Danilovich; Kiselev, Boris Eliseevich; Kostjukovich, Vladimir Ivanovich; Mikhailovsky, Leonid Nikolaevich; Ryabikova, Julia Nikitichna; and Trofimov, Viktor Ivanovich, 4,080,697, Cl. 29-33.00K.

Trutzschler GmbH & Co. KG: *See—*
Oellers, Walter, 4,080,688, Cl. 19-204.000.

TRW Inc.: *See—*
Dawson, John Myrick, 4,081,677, Cl. 250-290.000.
Templin, Alan S., 4,081,315, Cl. 156-653.000.

Tseng, Chien Knei: *See—*
Baker, Don Robert; Walker, Francis Harry; and Tseng, Chien Knei, 4,081,468, Cl. 260-551.00R.

Tseng, Eugene: *See—*
Bassin, Morton; and Tseng, Eugene, 4,081,259, Cl. 65-21.000.

Tsubuko, Kazuo; Kurotori, Tsuneo; Kimura, Taro; Kawanishi, Toshiyuki; and Kaneko, Yoshikazu, to Ricoh Co., Ltd. Liquid developer for use in electrophotography. 4,081,391, Cl. 252-62.10L.

Tsuji, Teruji: *See—*
Uyeo, Shoichiro; Itani, Hikaru; Aoki, Tsutomu; Tsuji, Teruji; and Nagata, Wataru, 4,081,443, Cl. 260-239.100.

Tsumura, Ryuichirou; Takaki, Usaji; and Abe, Takeshi, to Mitsui Toatsu Chemicals Inc. Process for preparation of aromatic isocyanates. 4,081,472, Cl. 260-453.00P.

Tsutsumi, Fumio: *See—*
Kerman, Stephen E.; and Tsutsumi, Fumio, 4,081,624, Cl. 179-99.000.

Tucci, Patrick A.: *See—*
Dao, Tich T.; and Tucci, Patrick A., 4,081,822, Cl. 357-44.000.

Tucker, Deborah E., to Harrison Leather Goods Corporation. Modular luggage. 4,081,061, Cl. 190-52.000.

Tumasiants, Igor Veniaminovich: *See—*
Repolovsky, Alexandr Ivanovich; Pakhter, Ilya Kharitonovich; Rudakov, Alexei Dmitrievich; Baranov, Alexandr Nikolaevich; Gliner, Leonid Efimovich; Gapoian, Dmitry Trdatovich; and Tumasiants, Igor Veniaminovich, 4,080,875, Cl. 92-29.000.

Turnquist, Paul E.: *See—*
Fuzzell, Joe E.; and Turnquist, Paul E., 4,080,940, Cl. 123-117.00D.

Twin County Trans-Video, Inc.: *See—*
Tang, Danny Q. H.; and Yee, Bark L., 4,081,831, Cl. 358-114.000.

Tybus, Axel W.; and Fabrizio, Leonard A., to Hooker Chemicals & Plastics Corporation. Polyvinyl chloride compositions. 4,081,413, Cl. 260-23.0XA.

Tyson, Gordon. Multi-purpose therapeutic pad. 4,081,150, Cl. 128-402.000.

Uckert, Gotthard: *See—*
Laue, Karl Heinrich; Sander, Theo; Sauder, Peter; and Uckert, Gotthard, 4,081,511, Cl. 423-239.00A.

Udall, Humfrey N.: *See—*
Rudd, Wallace C.; and Udall, Humfrey N., 4,081,648, Cl. 219-59.100.

Uemura, Sashiro, to Ise Electronics Corporation. Luminescent display tube with plural cathodes and electron flux dispersing means. 4,081,715, Cl. 315-13.00R.

Uemura, Sashiro, to Ise Electronics Corporation. Fluorescent display elements. 4,081,716, Cl. 313-63.000.

Uffer, Michael B.; and Wang, Clarence, to Baxter Travenol Laboratories, Inc. Heater shutdown circuit. 4,081,660, Cl. 219-504.000.

Ugo, Renato. Process for separating and recovering rhodium and iridium from their mixtures with other precious metals. 4,081,271, Cl. 75-108.000.

Ulick, Stanley. Aldosterone antagonists. 4,081,538, Cl. 424-241.000.

Ulrich, Charles: *See—*
Tanaka, Akira; and Ulrich, Charles, 4,081,153, Cl. 242-107.000.

Underberg Gesellschaft mit beschrankter Haftung: *See—*
Dold, Siegfried, deceased, 4,081,097, Cl. 215-252.000.

Underwood, Herbert N., to Borg-Warner Corporation. Vehicle accessory drive. 4,080,843, Cl. 74-336.00R.

Union Carbide Corporation: *See—*
D'Silva, Themistocles D. J., 4,081,550, Cl. 424-298.000.
D'Silva, Themistocles Damasceno Joaquim, 4,081,454, Cl. 424-304.000.
Hanold, R. C. Frederick, III, 4,081,857, Cl. 361-321.000.
Hawkins, Albert W.; O'Hara, Matthew J.; Gortsema, Frank P.; and Hedaya, Eddie, 4,081,574, Cl. 427-237.000.
Kupcikevicius, Vytautas, 4,081,096, Cl. 53-35.000.
Tichauer, Paul Arthur; Adams, James Stephen; and Thokar, Henry Desmont, 4,081,270, Cl. 75-60.000.

Union Oil Company of California: *See—*
Holm, LeRoy W., 4,081,029, Cl. 166-270.000.

Uniroyal, Inc.: *See—*
Moore, Thomas W.; Hager, Richard A.; and Clarkson, Robert J., 4,080,694, Cl. 28-170.000.
Shichman, Daniel; Percarpio, Peter E.; and Black, Sheppard A., 4,081,310, Cl. 156-398.000.

United S. C. F., Inc.: *See—*
Harris, Raymond, 4,081,045, Cl. 177-163.000.

United States of America
Air Force: *See—*
Addoms, John F.; and McGough, Charles B., 4,081,136, Cl. 239-127.100.
Graff, Albert J., 4,081,177, Cl. 256-12.000.
Petry, Gene A., 4,081,157, Cl. 244-137.00R.
Ravis, James C.; and Hedman, Curtis P., 4,081,785, Cl. 340-5.00R.
Ray, David J., 4,081,744, Cl. 324-63.000.
Sutton, Joel F.; Mattson, Allen R.; and Anders, Larry E., 4,081,137, Cl. 239-127.300.
Tamborski, Christ, 4,081,473, Cl. 260-453.0RW.
America as represented by Administrator U.S. Environmental Protection Agency: *See—*
Moss, Gerald, 4,081,513, Cl. 423-244.000.
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Goans, Ronald E.; Cantrell, John H., Jr.; Meyers, F. Bradford; and Stambaugh, Harry D., 4,080,960, Cl. 128-2.00V.
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Colli, Albert J., 4,081,251, Cl. 44-1.00R.
Elmore, Richard E.; and Plumb, Richard L., 4,081,802, Cl. 343-5.0ST.
Lee, Thomas W., 4,081,787, Cl. 340-147.00R.
Peterson, Karl F., 4,081,749, Cl. 325-113.000.
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Mossel, Anthonius Clemens; and Hertogh, Joannes Petrus, 4,081,714, Cl. 313-493.000.
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van den Enden, Adrianus Wilhelmus Maria; de Niet, Edmond; and Deurwaarder, Marinus Adriaan, 4,081,855, Cl. 361-203.000.
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Welle, Hendricus Bernardus Antonius; and Claassen, Volkert, 4,081,552, Cl. 424-304.000.
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United Technologies Corporation: *See—*
Andrews, Merritt B., 4,081,220, Cl. 416-226.000.
Andrews, Merritt B., 4,081,221, Cl. 416-227.00A.
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Vogel, Eric S., 4,081,295, Cl. 148-11.50N.
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Christman, William J., 4,081,354, Cl. 208-235.000.
Gatsis, John G.; and Tan, Gim, 4,081,359, Cl. 208-8.000.
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Nelson, Stephen J., 4,081,536, Cl. 424-211.000.
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Upright, Neil. Heater system for railroad switch. 4,081,161, Cl. 246-428.000.
Urano, Fumio; and Arai, Akihiro, to Asahi Kogaku Kogyo Kabushiki Kaisha. Reflex mirror for single lens reflex camera. 4,081,807, Cl. 354-152.000.
Urban, Joseph A. Board game apparatus. 4,081,183, Cl. 273-249.000.
USM Corporation: *See—*
Bellis, John Louis, 4,080,888, Cl. 100-47.000.
Chaplick, Adolph Michael, 4,080,680, Cl. 12-146.00D.
Hall, Dennis Sidney, 4,081,311, Cl. 156-475.000.
Lovett, Albert Edward, 4,080,679, Cl. 12-38.000.
Woodman, Daniel Wayne, Jr., 4,080,730, Cl. 29-701.000.
Uyeo, Shoichiro; Itani, Hikaru; Aoki, Tsutomu; Tsuji, Teruji; and Nagata, Wataru, to Shionogi & Co., Ltd. Penicillin oxides. 4,081,443, Cl. 260-239.100.
Valastro, Bartolo; and Stipcevic, Franko, to L.M. Ericsson Pty. Ltd. Fast access antiphase control memory for digital data switches. 4,081,610, Cl. 179-15.0AT.
Valastro, Bartolo: *See—*
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Vanassche, Willy Joseph; Pattyn, Herman Alberik; and Borginon, Hendrik Alfons, to AGFA-GEVAERT N.V. Developing low fogged, direct-positive silver halide emulsion with an energetic developer free from halide ions. 4,081,281, Cl. 96-64.000.
Van Breemen, Bertram; Miller, Robert A.; and Wells, Roger D., to Mead Corporation, The. Catcher mounting apparatus for a jet drop printer. 4,081,804, Cl. 346-75.000.
Van Buskirk, Lyman F., to United States of America, Navy. Low altitude optical altimeter. 4,081,214, Cl. 356-4.000.
van Daalen, Peter, to B.V. Machinefabriek M. Brouwer & Co. Apparatus for filling a receptacle, particularly with spinning bobbins. 4,080,773, Cl. 53-142.000.
van den Broek, William A., to KDI Sylvan Pools, Inc. Gutter system. 4,080,670, Cl. 4-172.170.
van den Enden, Adrianus Wilhelmus Maria; de Niet, Edmond; and Deurwaarder, Marinus Adriaan, to U.S. Philips Corporation. Current pulse generator. 4,081,855, Cl. 361-203.000.
Vanderpool, Charles C. Headlight cleaning system. 4,080,685, Cl. 15-250.010.
van der Veer, Rutgerus Antonius, to International Telephone and Telegraph Corporation. Valve interlock. 4,081,235, Cl. 431-54.000.
van Essen, Willem J.; Shanoski, Henry; and Griffith, Richard M., to General Tire & Rubber Company, The. In-mold coating composition and method of applying same. 4,081,578, Cl. 428-63.000.
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Vassos, Louis J.; Heinz, John W.; and Hartmann, James R., to Skil Corporation. Powered hand-held tool with unitary sub-assembly mounted by the tool housing sections. 4,081,704, Cl. 310-50.000.
Vaux, Harvey W. Quick disconnect coupling. 4,080,690, Cl. 24-201.00R.
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Vetter, Lothar; Forster, Karl-Heinz; and Schanze, Klaus, 4,081,723, Cl. 318-38.000.
Venditti, Gaetan. Coating applicator. 4,080,684, Cl. 15-104.00S.
Vendramini, Dante. Automatic telephone dialling apparatus. 4,081,618, Cl. 179-90.0CS.
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Vetter, Lothar; Forster, Karl-Heinz; and Schanze, Klaus, to Veb Polygraph Leipzog Kombinat fur Polygraphische Maschinen und Ausrustungen. Printing machine. 4,081,723, Cl. 318-38.000.
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Vigh, Sandor. High chair spacer. 4,080,770, Cl. 52-689.000.
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Vincent, Edward T.; and Cheklich, George E., to United States of America, Army. Metering fuel by compressibility. 4,080,942, Cl. 123-139.0AT.
Violi, Mario, to Legrand S.A. Tool for tightening clamps. 4,081,002, Cl. 140-123.600.
Vitols, Visvaldis A.; and Paul, James E., Jr., to Rockwell International Corporation. Keyword detection in continuous speech using continuous asynchronous correlation. 4,081,607, Cl. 179-1.0SB.
Vlasenko, Natalya Andreevna; and Pukhly, Zhanneta Alexandrovna. Electroluminescent laser. 4,081,763, Cl. 331-94.50H.
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Sprecker, Mark A.; Vock, Manfred Hugo; Schmitt, Frederick Louis; Hall, John B.; and Sanders, James Milton, 4,081,481, Cl. 260-586.00R.

Vogel, Eric S., to United Technologies Corporation. Fabricating process for high strength, low ductility nickel base alloys. 4,081,295, Cl. 148-11.50N.

Vogel, Richard E.: *See—*
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Vollers, Evert Jan, to Van Doorne's Transmissle B.V. Push element for transmission belt. 4,080,841, Cl. 74-236.000.

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vom Dorp, Heinz, to Wilhelm Hegenscheidt Gesellschaft mbH. Method for controlling proper clamping of a workpiece in a clamping device. 4,080,716, Cl. 29-559.000.

Von Roll AG: *See—*
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Von Stutterheim, Friedrich; and Wurm, Jorg. Process for the continuous electrolytic plating of metal wire, strips, chains, and gauze strips with metals. 4,081,335, Cl. 204-28.000.

Voss, William B. Double-stub transmission line elements in communication networks. 4,081,767, Cl. 333-7.00R.

Voss, William B.; and Julian, Renne S. Single-stub transmission line elements in communication networks. 4,081,768, Cl. 333-9.000.

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Wahren, Douglas; and Stenberg, Erik Gunnar, to Aktiebolaget Karlstads Mekaniska Werkstad. Method and apparatus for separating a fibrous web from a foraminous belt. 4,081,320, Cl. 162-205.000.

Wain, Harry C. Rim pump. 4,080,952, Cl. 125-13.00R.

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Walden, Richard D. Portable tape player and tape container. 4,081,850, Cl. 360-137.000.

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Wallace Business Forms, Inc.: *See—*
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Wallace, Richard B., to Oakland Corporation, The. Thread lock. 4,081,012, Cl. 151-14.500.

Walsh, Robert M.; and Droughton, John V., to AQM Corporation. Water saving device. 4,080,667, Cl. 4-415.000.

Walter Kidde & Company, Inc.: *See—*
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Walter, Lewis A., to Schering Corporation. Certain 2-(alpha(2-pyridyl)-benzyl)imidazolines and derivatives thereof. 4,081,544, Cl. 424-263.000.

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Wardlaw, Harold W. R., to Brown Oil Tools, Inc. Connecting assembly and method. 4,081,039, Cl. 175-7.000.

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Washburn, Joseph W.; and Ashton, Thomas A. Telephone disabling device. 4,081,630, Cl. 179-189.00R.

Washizuka, Isamu; and Hashimoto, Shintaro, to Sharp Kabushiki Kaisha. Calculator operation time period counter in a combination of electronic timepiece and electronic calculator. 4,081,664, Cl. 364-705.000.

Wassen, Willem J.; and Goettsch, Reijer, to Stamicarbon, B.V. Process for the recovery of ε-caprolactam from a reaction mixture of ε-caprolactam and sulphuric acid. 4,081,442, Cl. 260-239.30A.

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Watson, John D. Fluid-abrasive nozzle device. 4,080,762, Cl. 51-439.000.

Wax, Bernard. Spark plug. 4,081,711, Cl. 313-143.000.

Webasto-Werk W. Baier GmbH & Co.: *See—*
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Weber, Adolph Carl, to Midwestern Joists, Inc. Method of erecting formwork system. 4,080,712, Cl. 29-458.000.

Weber, Roger; and Lotte, Andre, to Societe Alsacience de Constructions Mechaniques de Mulhouse. Rotary printing machines. 4,080,894, Cl. 101-128.100.

Wedell, David A., to Black, James A. Ink scoop squeegee assembly. 4,080,893, Cl. 101-124.000.

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Wehrmeister, Gerhard: *See—*
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Weidler, Jay B., Jr., to Brown & Root, Inc. Methods and apparatus for applying buoyant forces to offshore tower legs and providing and enclosing buoyancy chambers. 4,080,795, Cl. 61-88.000.

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Welle, Hendricus Bernardus Antonius; and Claassen, Volkert, to U.S. Philips Corporation. Oxime ethers having anti-depressive activity. 4,081,551, Cl. 424-304.000.

Welle, Hendricus Bernardus Antonius; and Claassen, Volkert, to U.S. Philips Corporation. Oxime ethers having anti-depressive activity. 4,081,552, Cl. 424-304.000.

Weller, Victor. Truss aligning system. 4,080,771, Cl. 52-735.000.

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Werneke, Michael Francis; and Van Wyk, Joseph, to American Cyanamid Company. Process for selective flocculation of hematitic iron ores in the presence of non-ferrous minerals. 4,081,357, Cl. 209-5.000.

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Wesner, Charles R., to Sperry Rand Corporation. Pulse width modulated servo amplifier with over-current protection. 4,081,731, Cl. 318-599.000.

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West, Louis J. Double fisherman's pail. 4,081,101, Cl. 220-23.400.

West, Theodore H.; Eagen, John F.; and Gudelis, David A., to Exxon Research & Engineering Co. Combination extraction-dewaxing of waxy petroleum oils. 4,081,352, Cl. 208-36.000.

Westcott, Lawrence, to Wiggins Teape Limited. Paper having microcapsules deposited in depressions on a surface thereof has improved smudge-resistance characteristics. 4,081,188, Cl. 282-27.500.

Wester, Sanfrid J., to Raymond Lee Organization, Inc., The, a part interest. Thermostat substitution circuit device. 4,081,022, Cl. 165-11.000.

Westerman, Floyd. Door latch. 4,080,757, Cl. 49-322.000.

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Koo, Jackson Chik-Yun; and Zaleckas, Vincent Joseph, 4,081,653, Cl. 219-121.0LM.

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Wheeler, Robert C., to GTE Sylvania Incorporated. Contrast control circuitry for a video processing system. 4,081,838, Cl. 358-169.000.
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White, Billy H.; and Griffin, William R., to White, Billy H.; Griffin, William R.; and Andrews, Stanley R. Fishing rod support belt. 4,081,115, Cl. 224-5.00E.
White, Eugene B.; and Sharma, Mahindar N., to Filters International Inc. Methods for use in water purification particularly sewage treatments. 4,081,365, Cl. 210-3.000.
White, Lionel S., Jr.; McAdams, Hugh P.; and Redwine, Donald J., to Texas Instruments Incorporated. High speed sense amplifier for MOS random access memory. 4,081,701, Cl. 307-355.000.
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Hofmeister, Helmut; Wiechert, Rudolf; Annen, Klaus; Laurent, Henry; and Steinbeck, Hermann, 4,081,537, Cl. 424-238.000.
Wieder, Horst K. Combustion product detector. 4,081,684, Cl. 250-381.000.
Wietsma, Popke, to Chemische Industrie AKU-Goodrich B.V. Preparation of impregnated fibers. 4,081,318, Cl. 162-157.00R.
Wiggins Teape Limited: *See—*
Westcott, Lawrence, 4,081,188, Cl. 282-27.500.
Wilburn, Everett R.; and Sorter, James C. Vehicle top article carrier. 4,081,095, Cl. 214-450.000.
Wiley, George Richard: *See—*
Hildreth, Bradrick Alan; Stephens, Donald Harrison; and Wiley, George Richard, 4,081,782, Cl. 338-200.000.
Wilhelm Hegenscheidt Gesellschaft mbH: *See—*
vom Dorp, Heinz, 4,080,716, Cl. 29-559.000.
Wilhelm, William D. Building wall with applied finishing surface design. 4,080,767, Cl. 52-314.000.
Willdorf, Michael E., to Material Distributors Corporation. Solar control film for use by consumers and the like. 4,081,300, Cl. 156-71.000.
Williams, Clark R., deceased; and Schnurr, Robert H., to Texas Instruments Incorporated. Electronic time keeping system. 4,080,780, Cl. 58-50.00R.
Williams, G. Norman: *See—*
Gallaro, Anthony V.; and Williams, G. Norman, 4,080,695, Cl. 29-25.130.
Williams, Samuel R. H., Jr. Heated and air injected tank for parts cleaner. 4,080,975, Cl. 134-94.000.
Wilms, Elmar; and Michalczyk, Georg, to Deutsche Texaco Aktiengesellschaft. Oligomerization of unsaturated hydrocarbons with a molybdenum catalyst. 4,081,404, Cl. 252-439.000.
Wilson, Wayne D.; and Delagrange, Arthur D., to United States of America, Navy. Omnidirectional monitor buoy. 4,081,784, Cl. 340-3.00D.
Wilson, Woodrow S.; and Hazard, Robert E., to Polytop Corporation. Tamper evident one-piece dispensing closures. 4,081,108, Cl. 222-153.000.
Wilting, Hermanus Josephus H., to U.S. Philips Corporation. Method of manufacturing a semiconductor device and device manufactured according to the method. 4,080,719, Cl. 29-571.000.
Winkler, Bruno, to Naturin-Werk Becker & Co. Process for the production of edible wreath-shaped food casings. 4,081,562, Cl. 426-390.000.
Winn, Martin, to Abbott Laboratories. Heterocyclic esters of alkylphenyl benzopyranopyridines. 4,081,449, Cl. 260-293.580.
Wise, William L.: *See—*
Berg, Anthony D.; and Wise, William L., 4,081,765, Cl. 331-94.50C.
Witt, Donald R.: *See—*
Short, James N.; and Witt, Donald R., 4,081,407, Cl. 252-458.000.
Wojtowicz, Jan: *See—*
Gray, Thomas J.; Wojtowicz, Jan; and Baker, Max, 4,081,005, Cl. 141-32.000.
Wolf, Jakob; and Lasschuit, Iwan, to J. M. Voith GmbH. Movable deckle within headbox outlet. 4,081,321, Cl. 162-346.000.
Wollenmann, Hans Peter, to Ruti Machinery Works Ltd. Weft insertion nozzle arrangement for a weaving machine. 4,081,000, Cl. 139-435.000.
Wolters, Gerhard, to Daimler-Benz Aktiengesellschaft. Air-compressing four-cycle internal combustion engine with direct fuel injection. 4,080,937, Cl. 123-32.00G.
Woltersdorf, Otto W., Jr.: *See—*
Cragoe, Edward J., Jr.; and Woltersdorf, Otto W., Jr., 4,081,554, Cl. 424-317.000.
Wolvek, Sidney: *See—*
Bregman, David; Hanson, Bruce L.; and Wolvek, Sidney, 4,080,958, Cl. 128-1.00D.
Wong, John Lui, to Research Corporation. Bridgehead nitrogen analogs of poly-chlorinated cyclic hydrocarbon insecticides. 4,081,448, Cl. 260-290.0HL.
Wong, Theodore T. S., to Honeywell Inc. Mercury cadmium telluride device. 4,081,819, Cl. 357-30.000.
Woodard, Kenneth E., Jr.: *See—*
Kadija, Igor V.; and Woodard, Kenneth E., Jr., 4,081,350, Cl. 204-296.000.
Woodman, Daniel Wayne, Jr., to USM Corporation. Machine for assembling components. 4,080,730, Cl. 29-701.000.
Worldwide Plastics Development Limited: *See—*
Shead, Terence H. C., 4,081,099, Cl. 220-6.000.
Wright, Dennis L. Hearth construction and method of manufacture. 4,081,237, Cl. 432-3.000.
Wulf, Hans-Jurgen: *See—*
Schussler, Hans; Wulf, Hans-Jurgen; Rall, Bernhard; and Knapp, Helmut, 4,081,792, Cl. 340-166.00R.
Wurm, Jaroslav: *See—*
Rush, William F.; Wurm, Jaroslav; and Dufour, Raymond J., 4,081,024, Cl. 165-62.000.
Wurm, Jorg: *See—*
Von Stutterheim, Friedrich; and Wurm, Jorg, 4,081,335, Cl. 204-28.000.
Wurster, Erich: *See—*
Hemala, Zdenek; Nudinger, Gunter; Wehrmeister, Gerhard; Mair, Reinhard; and Wurster, Erich, 4,080,776, Cl. 57-34.00R.
Wyberg, Gregory R.: *See—*
Mitchell, William C.; and Wyberg, Gregory R., 4,080,953, Cl. 126-263.000.
Wyman, Ransome J.; and Gupta, Laxmi C., to ARNCO. Heat-stabilized polyurethane elastomer. 4,081,429, Cl. 260-77.5AB.
Xerox Corporation: *See—*
Bar-on, Ari; and Hattler, Louis R., 4,081,213, Cl. 355-3.0FU.
Goffe, William L., 4,081,273, Cl. 96-1.0PS.
Gundlach, Robert W., 4,080,897, Cl. 101-467.000.
Horgan, Anthony M., 4,081,274, Cl. 96-1.0PC.
Pacansky, Thomas J., 4,081,572, Cl. 427-53.000.
Yagi, Toshio. Garbage disposal apparatus. 4,081,146, Cl. 241-152.00A.
Yaita, Masato, to Sekisui Kaseihin Kogyo Kabushiki Kaisha. Steam aperture device. 4,081,225, Cl. 425-4.00R.
Yamada, Shigeru: *See—*
Hiyoshi, Teruo; Nakada, Akira; Yamada, Shigeru; Ichikawa, Kiyoshi; and Ishii, Shigeki, 4,080,862, Cl. 84-1.240.
Yamaguchi, Goichi: *See—*
Takiyama, Eiichiro; Sugimoto, Toshiaki; Yamaguchi, Goichi; and Nagao, Susumu, 4,081,591, Cl. 526-217.000.
Yamamoto, Katsuhiko: *See—*
Kitajima, Soichi; Ishiguro, Toshiyuki; Kanno, Tadao; Yamamoto, Katsuhiko; and Hori, Makoto, 4,081,233, Cl. 431-1.000.
Yamamoto, Kousuke; Takenaka, Ahinji; and Maeda, Kazuo, to Mitsui Toatsu Chemicals, Inc. Process for continuously producing anhydrous sodium dithionite. 4,081,521, Cl. 423-515.000.
Yamamoto, Masami; Yamazaki, Fumiaki; Hosoda, Akira; Hashimoto, Hiromi; and Tan, Yoichi, to Nippon Telegraph and Telephone Public Corporation; and Nippon Electric Co., Ltd. Code converter. 4,081,790, Cl. 340-146.1BE.
Yamamoto, Roy I.; Cusano, Carmen M.; and Gaetani, Frank J., to Texaco Inc. 4-Vinylpyridine polymethacrylate containing lube oil compositions. 4,081,385, Cl. 252-32.70E.
Yamashita, Norihisa: *See—*
Hashimoto, Shunichi; Kirino, Osamu; Ozaki, Toshiaki; and Yamashita, Norihisa, 4,081,267, Cl. 71-93.000.
Yamazaki, Fumiaki: *See—*
Yamamoto, Masami; Yamazaki, Fumiaki; Hosoda, Akira; Hashimoto, Hiromi; and Tan, Yoichi, 4,081,790, Cl. 340-146.1BE.
Yanagawa, Isamu: *See—*
Hikosaka, Noboru; and Yanagawa, Isamu, 4,080,945, Cl. 123-195.00C.
Yang, Kang; Reedy, James D.; and Lindberg, Robert C., to Continental

Oil Company. Nitrite-impregnated carbon for the adsorption recovery of VCM. 4,081,512, Cl. 423-240.000.

Yarwood, John C.; Dore, James E.; and Preuss, Robert K., to Swiss Aluminium Ltd. Filtering of molten metal. 4,081,371, Cl. 210-69.000.

Yasui, Syozo: *See*—
Koblasz, Arthur J.; Fender, Derek H.; Yasui, Syozo; and Dekker, Cornelis M., 4,081,858, Cl. 364-553.000.

Yasumoto, Hiroshi: *See*—
Tokumitsu, Ichiro; Konuma, Hideo; Mochizuki, Shigeaki; Okada, Yoshio; Yasumoto, Hiroshi; and Yoshihiro, Isao, 4,081,497, Cl. 260-880.00R.

Yasunaga, Soichiro. Digital-analog indicating system. 4,081,745, Cl. 324-99.00R.

Yates, Jan B., to Caterpillar Tractor Co. Hydraulic steering with feedback. 4,081,054, Cl. 180-139.000.

Yee, Bark L.: *See*—
Tang, Danny Q. H.; and Yee, Bark L., 4,081,831, Cl. 358-114.000.

Yen, Wai Lit. Output signal correcting circuit. 4,081,759, Cl. 330-295.000.

Yi, Chong Sun. Chalk board eraser. 4,080,683, Cl. 15-98.000.

Yokoyama, Masao, to Kabushiki Kaisha Komatsu Seisakusho. Mounting arrangement for supporting bulldozer blade. 4,081,036, Cl. 172-804.000.

Yoneyama, Tsuneo: *See*—
Amemiya, Hiroshi; Tarui, Tadaaki; and Yoneyama, Tsuneo, 4,081,800, Cl. 340-347.0NT.

York, David L.: *See*—
York, Richard N.; and York, David L., 4,081,687, Cl. 250-505.000.

York, Richard N.; and York, David L., to Precise Corporation. Collimator for gamma ray cameras. 4,081,687, Cl. 250-505.000.

Yoshida, Chisato; and Mori, Takasuke, to Kobe Steel, Ltd. Process for production of lamellar graphite-containing material. 4,080,715, Cl. 29-527.700.

Yoshida, Masaru; and Kaetsu, Isao, to Japan Atomic Energy Research Institute. Curable resin composition for abrasion-resistant coating. 4,081,421, Cl. 260-32.8EP.

Yoshida, Shuzo: *See*—
Akita, Sigeyuki; and Yoshida, Shuzo, 4,080,828, Cl. 73-308.000.

Yoshihiro, Isao: *See*—
Tokumitsu, Ichiro; Konuma, Hideo; Mochizuki, Shigeaki; Okada, Yoshio; Yasumoto, Hiroshi; and Yoshihiro, Isao, 4,081,497, Cl. 260-880.00R.

Yoshikawa, Tadashi: *See*—
Onishi, Masanori; Yoshikawa, Tadashi; Ikoma, Kiyoshi; and Nakakohara, Tetsuya, 4,081,849, Cl. 360-137.000.

Yoshinaga, Chiharu: *See*—
Takegami, Shinsuke; Korenaga, Takashi; and Yoshinaga, Chiharu, 4,081,401, Cl. 252-428.000.
Takegami, Shinsuke; Korenaga, Takashi; and Yoshinaga, Chiharu, 4,081,403, Cl. 252-428.000.

Youmans, Donald W., to FMC Corporation. Steerable front wheel drive unit. 4,081,049, Cl. 180-43.00C.

Youngdale, Gilbert A., to Upjohn Company, The. 2a,2b-Dihomo-15-alkyl-PGE$_1$ analogs. 4,081,471, Cl. 260-410.90R.

Yumde, Yasufumi: *See*—
Takamiya, Tadashi; and Yumde, Yasufumi, 4,081,834, Cl. 358-158.000.

Zabotin, Alexandr Alexandrovich: *See*—
Borodin, Valerian Alexeevich; Onikov, Eduard Arshakovich; Sakharov, Boris Alexandrovich; Zabotin, Alexandr Alexandrovich; Loschilin, Evgeny Dmitrievich; and Galperin, Alexandr Lvovich, 4,081,001, Cl. 139-436.000.

Zahid, Abduz, to Greer Hydraulics, Inc. Pressure pulse dampener device. 4,080,996, Cl. 138-30.000.

Zakharov, Leonid Mikhailovich: *See*—
Shraiber, David Solomonovich; Golodaev, Boris Glebovich; Zakharov, Leonid Mikhailovich; and Razumovsky, Anatoly Fedorovich, 4,080,839, Cl. 73-617.000.

Zaleckas, Vincent Joseph: *See*—
Koo, Jackson Chik-Yun; and Zaleckas, Vincent Joseph, 4,081,653, Cl. 219-121.0LM.

Zanini, Gerard Alexandre: *See*—
Decombe, Albert Alphonse; and Zanini, Gerard Alexandre, 4,080,708, Cl. 29-401.00F.

Zapp, Walter. Keyboard actuable with the aid of the fingers of at least one hand. 4,081,068, Cl. 197-98.000.

Zappia, Anthony T., to Powers Manufacturing, Inc. Apparatus for transferring parts. 4,081,073, Cl. 198-430.000.

Zausmer, Norman A.: *See*—
Chapelsky, Orest; and Zausmer, Norman A., 4,080,989, Cl. 137-588.000.

Zenith Radio Corporation: *See*—
Hendrickson, Melvin Carlyle, 4,081,771, Cl. 334-15.000.

Zenses, Carl. Accessory for a hand drill. 4,080,698, Cl. 29-76.00R.

Zeochem Corporation: *See*—
Sand, Leonard B.; and Dodwell, Glenn W., 4,081,514, Cl. 423-328.000.

Zephyr Wind Dynamo Company: *See*—
Gillette, Willard D., 4,080,724, Cl. 29-598.000.

Zierdt, Willadene S., to United States of America, Health, Education and Welfare. Fecalator, an apparatus and method for concentration of parasite eggs and larvae. 4,081,356, Cl. 209-3.000.

Zimmer, Erich: *See*—
Proplesch, Peter; and Zimmer, Erich, 4,081,506, Cl. 423-41.000.

Zimmerman, Dennis M., to Eli Lilly and Company. 1,3,4-Trisubstituted-4-arylpiperidines and their preparation. 4,081,450, Cl. 260-293.670.

Zimmerman, Emil F. Tractor with lifting mechanism for mounting a bulldozer blade or the like. 4,081,092, Cl. 214-131.00R.

Zimmermann, Ulrich; Riemann, Friedrich; and Pilwat, Gunter, to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung. Method of and device for increasing the permeability of the skin of cells of living beings. 4,081,340, Cl. 204-180.00R.

Zink, John S.; Reed, Robert D.; and Schwartz, Robert E., to John Zink Company. Airrester. 4,080,883, Cl. 98-58.000.

Zoellick, Allen Peter. Cover for drinking containers. 4,081,103, Cl. 220-254.000.

Zumwalt, Glen A.: *See*—
Perri, Michael J.; and Zumwalt, Glen A., 4,081,041, Cl. 175-209.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 28TH DAY OF MARCH, 1978

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Adams, Sally Lee; Martin, Fred David; and Cook, Michael M., to Calgon Corporation. Well cementing composition having improved flow properties containing a polyamido-sulfonic additive. Re. 29,595, Cl. 260-29.60S.

Bare, Conrad B.; and Pasquali, Joseph W., to Bethlehem Steel Corporation. Method for recovering vanadium-values from vanadium-bearing iron ores and iron ore concentrates. Re. 29,598, Cl. 423-68.000.

Bethlehem Steel Corporation: *See*—
Bare, Conrad B.; and Pasquali, Joseph W., Re. 29,598, Cl. 423-68.000.

Brownstein, Arthur M.; Jung, John A.; and Hansen, Robert, to Chem Systems Inc. Process for the production of epoxides. Re. 29,597, Cl. 260-348.160.

Calgon Corporation: *See*—
Adams, Sally Lee; Martin, Fred David; and Cook, Michael M., Re. 29,595, Cl. 260-29.60S.

Chem Systems Inc.: *See*—
Brownstein, Arthur M.; Jung, John A.; and Hansen, Robert, Re. 29,597, Cl. 260-348.160.

Cook, Michael M.: *See*—
Adams, Sally Lee; Martin, Fred David; and Cook, Michael M., Re. 29,595, Cl. 260-29.60S.

Fuchs, Francis Joseph, Jr., to Western Electric Co., Inc. Production of multiple elongated products such as wire. Re. 29,593, Cl. 72-42.000.

GAF Corporation: *See*—
Strobel, Albert F., Re. 29,596, Cl. 260-308.00B.

Hansen, Robert: *See*—
Brownstein, Arthur M.; Jung, John A.; and Hansen, Robert, Re. 29,597, Cl. 260-348.160.

Honeywell Inc.: *See*—
Ogawa, Francis T., Re. 29,599, Cl. 354-23.00D.

Jung, John A.: *See*—
Brownstein, Arthur M.; Jung, John A.; and Hansen, Robert, Re. 29,597, Cl. 260-348.160.

Lloyd, Samuel H., to Santa Fe International Corporation. Column stabilized stinger transition segment and pipeline supporting apparatus. Re. 29,591, Cl. 61-108.000.

Martin, Fred David: *See*—
Adams, Sally Lee; Martin, Fred David; and Cook, Michael M., Re. 29,595, Cl. 260-29.60S.

Norton Company: *See*—
Vinard, Daniel Robert, Re. 29,592, Cl. 51-298.00R.

Ogawa, Francis T., to Honeywell Inc. Control circuit for photographic apparatus. Re. 29,599, Cl. 354-23.00D.

Pasquali, Joseph W.: *See*—
Bare, Conrad B.; and Pasquali, Joseph W., Re. 29,598, Cl. 423-68.000.

Santa Fe International Corporation: *See*—
Lloyd, Samuel H., Re. 29,591, Cl. 61-108.000.

Sarkes Tarzian, Inc.: *See*—
Tkacenko, Nikola B., Re. 29,600, Cl. 358-183.000.

Strobel, Albert F., to GAF Corporation. Branched chain dodecyl isomeric mixtures of 2-(5-dodecyl-2-hydroxy phenyl) benzotriazole as stabilizers for heat and light sensitive materials. Re. 29,596, Cl. 260-308.00B.

Takada, Juichiro, heir: *See*—
Takada, Takezo, deceased; and Takada, Juichiro, heir, Re. 29,594, Cl. 242-107.40B.

Takada, Takezo, deceased; and by Takada, Juichiro, heir, to Takata Kojyo Co., Ltd. Automatic locking acceleration actuated vehicle safety belt retractor. Re. 29,594, Cl. 242-107.40B.

Takata Kojyo Co., Ltd.: *See*—
Takada, Takezo, deceased; and Takada, Juichiro, heir, Re. 29,594, Cl. 242-107.40B.

Tkacenko, Nikola B., to Sarkes Tarzian, Inc. Rotary special effects generator. Re. 29,600, Cl. 358-183.000.

Vinard, Daniel Robert, to Norton Company. Blow molding process for manufacturing grinding wheels. Re. 29,592, Cl. 51-298.00R.

Western Electric Co., Inc.: *See*—
Fuchs, Francis Joseph, Jr., Re. 29,593, Cl. 72-42.000.

LIST OF PLANT PATENTEES

Duffett, William E.: *See*—
Jessel, Walter H., Jr.; and Duffett, William E., 4,228, Cl. 74.000.
Jessel, Walter H., Jr.; and Duffett, William E., 4,229, Cl. 74.000.

Jessel, Walter H., Jr.; and Duffett, William E., to Yoder Brothers, Inc. Chrysanthemum plant. 4,228, 3-28-78, Cl. 74.000.

Jessel, Walter H., Jr.; and Duffett, William E., to Yoder Brothers, Inc. Chrysanthemum plant. 4,229, 3-28-78, Cl. 74.000.

Moore, Ralph S. Rose plant. 4,230, 3-28-78, Cl. 3.000.

Moore, Ralph S. Rose plant. 4,231, 3-28-78, Cl. 3.000.

Yoder Brothers, Inc.: *See*—
Jessel, Walter H., Jr.; and Duffett, William E., 4,228, Cl. 74.000.
Jessel, Walter H., Jr.; and Duffett, William E., 4,229, Cl. 74.000.

LIST OF DESIGN PATENTEES

A.E. Rex Nominees Pty. Ltd.: *See*—
Rex, Albert Edward, 247,617, Cl. D12-51.000.

American Luggage Works, Inc.: *See*—
Koffler, Sol, 247,654, Cl. D87-5.00G.
Koffler, Sol, 247,655, Cl. D87-5.00G.

Amiot, Anne T. Sculpturing tool. 247,608, 3-28-78, Cl. D8-98.000.

Arbib, Philip Brian; and Bruce, Douglas Charles, to Bib Hi-Fi Accessories Ltd. Cleaning arm for phonograph records. 247,622, 3-28-78, Cl. D14-27.000.

Aremka, Leonard R.; Genaro, Donald M.; Hagstrom, Arthur A.; and S...vick, Barry L., to Teletype Corporation. Teleprinter console. 247,643, 3-28-78, Cl. D64-11.00R.

Ball Corporation: *See*—
Wildgen, Leo F., 247,604, Cl. D7-65.000.

Bausch & Lomb Incorporated: *See*—
Huckenbeck, Claus O., 247,625, Cl. D16-61.000.

Berman, Bernard H. Bar of soap. 247,644, 3-28-78, Cl. D73-1.00A.

Bib Hi-Fi Accessories Ltd.: *See*—
Arbib, Philip Brian; and Bruce, Douglas Charles, 247,622, Cl. D14-27.000.

Breger, Carl-Arne, to Dyno Merchandise Corporation. Scissors. 247,606, 3-28-78, Cl. D8-57.000.

Bruce, Douglas Charles: *See*—
Arbib, Philip Brian; and Bruce, Douglas Charles, 247,622, Cl. D14-27.000.

Cambra Cases Limited: *See*—
Woodhall, Michael Baden, 247,645, Cl. D87-1.00D.
Woodhall, Michael Baden, 247,646, Cl. D87-1.00D.

Carroll, James C.; and Johnson, Lewis T., to Phillips Petroleum Company. Bakery container or the like. 247,648, 3-28-78, Cl. D87-1.00R.

Carroll, James C.; and Johnson, Lewis T., to Phillips Petroleum Company. Bakery tray or the like. 247,649, 3-28-78, Cl. D87-1.00R.

Carroll, James C.; and Johnson, Lewis T., to Phillips Petroleum Company. Bakery tray or the like. 247,650, 3-28-78, Cl. D87-1.00R.

Carroll, James C.; and Johnson, Lewis T., to Phillips Petroleum Company. Bakery tray or the like. 247,651, 3-28-78, Cl. D87-1.00R.

Carroll, James C.; and Johnson, Lewis T., to Phillips Petroleum Company. Bakery container or the like. 247,652, 3-28-78, Cl. D87-1.00R.

Clairol Incorporated: *See*—
Wistrand, John, 247,630, Cl. D28-13.000.

Clary, John G.; and Weinkle, David. Amount display housing for cash register or the like. 247,641, 3-28-78, Cl. D52-4.00A.

Corson, Lee A.; and Corson, Robert S., to Crestline Furniture Company. Footstool. 247,594, 3-28-78, Cl. D6-36.000.

Corson, Lee A.; and Corson, Robert S., to Crestline Furniture Company. Sofa. 247,595, 3-28-78, Cl. D6-63.000.

Corson, Robert S.: *See—*
Corson, Lee A.; and Corson, Robert S., 247,594, Cl. D6-36.000.
Corson, Lee A.; and Corson, Robert S., 247,595, Cl. D6-63.000.

Crestline Furniture Company: *See—*
Corson, Lee A.; and Corson, Robert S., 247,594, Cl. D6-36.000.
Corson, Lee A.; and Corson, Robert S., 247,595, Cl. D6-63.000.

Cridland, Michael: *See—*
Pulos, Arthur J.; Cridland, Michael; and Wagner, Steven, 247,620, Cl. D14-1.000.

Data Packaging Corporation: *See—*
Lyman, George F., 247,599, Cl. D6-234.000.
Lyman, George F., 247,600, Cl. D6-234.000.

Di Benedetto, Luigi, to TRW Inc. Point-of-sale terminal. 247,640, 3-28-78, Cl. D52-4.00A.

Dictaphone Corporation: *See—*
Pulos, Arthur J.; Cridland, Michael; and Wagner, Steven, 247,620, Cl. D14-1.000.

Disston, Inc.: *See—*
Edgell, James E.; Lineback, Lynn D.; and Russell, William H., 247,619, Cl. D13-11.000.

Dyno Merchandise Corporation: *See—*
Breger, Carl-Arne, 247,606, Cl. D8-57.000.

Edgell, James E.; Lineback, Lynn D.; and Russell, William H., to Disston, Inc. Rechargeable battery pack. 247,619, 3-28-78, Cl. D13-11.000.

Eisen, Leonard. Hall tree. 247,592, 3-28-78, Cl. D6-19.000.

Emundts, Horst; and Kramer, Peter, to Klockner-Humboldt-Deutz Aktiengesellschaft. Tractor. 247,624, 3-28-78, Cl. D15-23.000.

Form, Incorporated: *See—*
Miller, James E., 247,605, Cl. D7-189.000.

Genaro, Donald M.: *See—*
Aremka, Leonard R.; Genaro, Donald M.; Hagstrom, Arthur A.; and Shevick, Barry L., 247,643, Cl. D64-11.00R.

Giles, Geoffrey Alan, to Metal Box Limited. Dispensing closure with pouring spout. 247,611, 3-28-78, Cl. D9-275.000.

Glaser, Harold, to James David Incorporated. Seat. 247,597, 3-28-78, Cl. D6-73.000.

Godard, Larry R. Gameboard. 247,632, 3-28-78, Cl. D34-5.0SS.

Grannis, Roland K., to Pacific Utilities Supply Co. Utility pole cross arm. 247,629, 3-28-78, Cl. D25-77.000.

Gravelle, Gordon C.: *See—*
Smith, David E.; and Gravelle, Gordon C., 247,634, Cl. D34-15.00P.

Grossman, Milton J. Combined chopping block and knife. 247,603, 3-28-78, Cl. D7-46.000.

Gwon, Pu Gill, to Pro-Tect, Inc. Foot protecting device. 247,591, 3-28-78, Cl. D2-271.000.

Hagstrom, Arthur A.: *See—*
Aremka, Leonard R.; Genaro, Donald M.; Hagstrom, Arthur A.; and Shevick, Barry L., 247,643, Cl. D64-11.00R.

Hashimoto, Osamu. Seat. 247,596, 3-28-78, Cl. D6-71.000.

Huber, Sally H. Tray for designing beaded jewelry. 247,647, 3-28-78, Cl. D87-1.00R.

Huckenbeck, Claus O., to Bausch & Lomb Incorporated. Telescope. 247,625, 3-28-78, Cl. D16-61.000.

James David Incorporated: *See—*
Glaser, Harold, 247,597, Cl. D6-73.000.

Johnson, Lewis T.: *See—*
Carroll, James C.; and Johnson, Lewis T., 247,648, Cl. D87-1.00R.
Carroll, James C.; and Johnson, Lewis T., 247,649, Cl. D87-1.00R.
Carroll, James C.; and Johnson, Lewis T., 247,650, Cl. D87-1.00R.
Carroll, James C.; and Johnson, Lewis T., 247,651, Cl. D87-1.00R.
Carroll, James C.; and Johnson, Lewis T., 247,652, Cl. D87-1.00R.

Kamenstein, Peter D. Multicompartment wallet. 247,653, 3-28-78, Cl. D87-3.00A.

Kearney, Raymond Joseph. Date display stand. 247,598, 3-28-78, Cl. D6-188.000.

Kelman, Pepi G. Earring. 247,614, 3-28-78, Cl. D11-75.000.

Klockner-Humboldt-Deutz Aktiengesellschaft: *See—*
Emundts, Horst; and Kramer, Peter, 247,624, Cl. D15-23.000.

Koffler, Sol, to American Luggage Works, Inc. Hand luggage. 247,654, 3-28-78, Cl. D87-5.00G.

Koffler, Sol, to American Luggage Works, Inc. Hand luggage. 247,655, 3-28-78, Cl. D87-5.00G.

Kramer, Peter: *See—*
Emundts, Horst; and Kramer, Peter, 247,624, Cl. D15-23.000.

Kreusler, George E. Lamp base. 247,638, 3-28-78, Cl. D48-20.00R.

Lamondine S.A.: *See—*
Sparkes, Curtis Albert, 247,618, Cl. D12-129.000.

Launder, James Mark. Hood for conveying and weighing system in an animal feeder. 247,613, 3-28-78, Cl. D10-94.000.

Lineback, Lynn D.: *See—*
Edgell, James E.; Lineback, Lynn D.; and Russell, William H., 247,619, Cl. D13-11.000.

Linick, James M. Medallion. 247,615, 3-28-78, Cl. D11-96.000.

Lucich, John C. Picture clock. 247,612, 3-28-78, Cl. D10-2.000.

Lyman, George F., to Data Packaging Corporation. Photograph display stand. 247,599, 3-28-78, Cl. D6-234.000.

Lyman, George F., to Data Packaging Corporation. Photograph display stand. 247,600, 3-28-78, Cl. D6-234.000.

Malcolite Corporation: *See—*
Win, Murray M., 247,636, Cl. D48-16.00A.
Win, Murray M., 247,637, Cl. D48-16.00A.

Maxwell, Donald James, to Rizla Limited. Buoyant wick holder. 247,635, 3-28-78, Cl. D48-2.000.

Metal Box Limited: *See—*
Giles, Geoffrey Alan, 247,611, Cl. D9-275.000.

Meyer, Gene. Flower holder for pews. 247,616, 3-28-78, Cl. D11-146.000.

Miller, James E., to Form, Incorporated. Concrete trash container. 247,605, 3-28-78, Cl. D7-189.000.

Pacific Utilities Supply Co.: *See—*
Grannis, Roland K., 247,629, Cl. D25-77.000.

Phillips Petroleum Company: *See—*
Carroll, James C.; and Johnson, Lewis T., 247,648, Cl. D87-1.00R.
Carroll, James C.; and Johnson, Lewis T., 247,649, Cl. D87-1.00R.
Carroll, James C.; and Johnson, Lewis T., 247,650, Cl. D87-1.00R.
Carroll, James C.; and Johnson, Lewis T., 247,651, Cl. D87-1.00R.
Carroll, James C.; and Johnson, Lewis T., 247,652, Cl. D87-1.00R.

Podall, Robert. Desk-top microphone unit. 247,621, 3-28-78, Cl. D14-12.000.

Ponce, Joseph A., Sr. Lamp. 247,639, 3-28-78, Cl. D48-20.00C.

Pro-Tect, Inc.: *See—*
Gwon, Pu Gill, 247,591, Cl. D2-271.000.

Pulos, Arthur J.; Cridland, Michael; and Wagner, Steven, to Dictaphone Corporation. Apparatus for monitoring remote transcribing operations in a central dictation system. 247,620, 3-28-78, Cl. D14-1.000.

Pulvers, Walter L. Computer. 247,623, 3-28-78, Cl. D14-45.000.

Rex, Albert Edward, to A.E. Rex Nominees Pty. Ltd. Rail insulating pad. 247,617, 3-28-78, Cl. D12-51.000.

Riches, George Henry Wiseman, to Riches, George Henry Wiseman; and Riches, Hester Edna, part interest to each. Combined file holder and writing instrument pocket. 247,626, 3-28-78, Cl. D19-90.000.

Riches, Hester Edna: *See—*
Riches, George Henry Wiseman, 247,626, Cl. D19-90.000.

Rizla Limited: *See—*
Maxwell, Donald James, 247,635, Cl. D48-2.000.

Russell, William H.: *See—*
Edgell, James E.; Lineback, Lynn D.; and Russell, William H., 247,619, Cl. D13-11.000.

Salem China Company, The: *See—*
Schreckengost, Don, 247,601, Cl. D7-9.000.

Schneider, Michael, Sr. Stabilizing attachment for an electric drill. 247,607, 3-28-78, Cl. D8-70.000.

Schreckengost, Don, to Salem China Company, The. Cup. 247,601, 3-28-78, Cl. D7-9.000.

Shannon, Richard D. Support for newly cropped dog ears. 247,631, 3-28-78, Cl. D30-40.000.

Shaw, Ralph B. Golf club head. 247,633, 3-28-78, Cl. D34-5.0GH.

Shevick, Barry L.: *See—*
Aremka, Leonard R.; Genaro, Donald M.; Hagstrom, Arthur A.; and Shevick, Barry L., 247,643, Cl. D64-11.00R.

Smith, David E.; and Gravelle, Gordon C. Body attached tethered ball game goal. 247,634, 3-28-78, Cl. D34-15.00P.

Southern Tool Mfg. Co., Inc.: *See—*
Triplette, Robert Eugene, 247,609, Cl. D8-323.000.

Sparkes, Curtis Albert, to Lamondine S.A. Stroller. 247,618, 3-28-78, Cl. D12-129.000.

Stanley, Peter W. Packaging container for seeds or the like. 247,610, 3-28-78, Cl. D9-237.000.

Steele, Rebecca D. Shower bath chair. 247,593, 3-28-78, Cl. D6-26.000.

Takeuchi, Kinjirou, to Takeuchi Seisakusho, Ltd. Fishing reel. 247,627, 3-28-78, Cl. D22-25.000.

Takeuchi Seisakusho, Ltd.: *See—*
Takeuchi, Kinjirou, 247,627, Cl. D22-25.000.

Teletype Corporation: *See—*
Aremka, Leonard R.; Genaro, Donald M.; Hagstrom, Arthur A.; and Shevick, Barry L., 247,643, Cl. D64-11.00R.

Triplette, Robert Eugene, to Southern Tool Mfg. Co., Inc. Hinge face plate for glass doors. 247,609, 3-28-78, Cl. D8-323.000.

TRW Inc.: *See—*
Di Benedetto, Luigi, 247,640, Cl. D52-4.00A.

Wagner, Steven: *See—*
Pulos, Arthur J.; Cridland, Michael; and Wagner, Steven, 247,620, Cl. D14-1.000.

Ward, Bruce K. Blank for a contained vent and insulation baffle. 247,628, 3-28-78, Cl. D23-137.000.

Watson, William J. Violin shoulder rest. 247,642, 3-28-78, Cl. D56-1.00A.

Weinkle, David: *See—*
Clary, John G.; and Weinkle, David, 247,641, Cl. D52-4.00A.

Wildgen, Leo F., to Ball Corporation. Covered pitcher. 247,604, 3-28-78, Cl. D7-65.000.

Williams, Barbara. Dough cutter. 247,602, 3-28-78, Cl. D7-43.000.

Win, Murray M., to Malcolite Corporation. Side panel for ceiling lights. 247,636, 3-28-78, Cl. D48-16.00A.

Win, Murray M., to Malcolite Corporation. Wide side panel for ceiling lights. 247,637, 3-28-78, Cl. D48-16.00A.

Wistrand, John, to Clairol Incorporated. Dryer. 247,630, 3-28-78, Cl. D28-13.000.

Woodhall, Michael Baden, to Cambra Cases Limited. Storage rack for magnetic tape cassettes. 247,645, 3-28-78, Cl. D87-1.00D.

Woodhall, Michael Baden, to Cambra Cases Limited. Storage rack for magnetic tape cartridges. 247,646, 3-28-78, Cl. D87-1.00D.

CLASSIFICATION OF PATENTS

ISSUED MARCH 28, 1978

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

8	4,080,664
209.1	4,080,665

CLASS 3

1.91	4,080,666

CLASS 4

172.17	4,080,670
236	4,080,671
325	4,080,668
	4,080,669
415	4,080,667

CLASS 5

13	4,080,672
62	4,080,673
310	4,080,674
345 R	4,080,675
371	4,080,676

CLASS 8

1 XA	4,081,239
94 A	4,081,240

CLASS 9

9	4,080,677

CLASS 11

1 AD	4,080,678

CLASS 12

38	4,080,679
146 D	4,080,680

CLASS 14

1	4,080,681

CLASS 15

3.1	4,080,682
98	4,080,683
104 S	4,080,684
250.01	4,080,685

CLASS 16

52	4,080,687
88	4,080,686

CLASS 19

204	4,080,688

CLASS 23

230 B	4,081,241
230 R	4,081,242
230.6	4,081,244
	4,081,245
	4,081,246
232 E	4,081,247
285	4,081,248
288 S	4,081,249

CLASS 24

20 EE	4,080,689
201 R	4,080,690
205.1 R	4,080,691

CLASS 26

91	4,080,692

CLASS 27

24 R	4,080,693

CLASS 28

170	4,080,694

CLASS 29

25.13	4,080,695
25.35	4,080,696
33 K	4,080,697
76 R	4,080,698
90 B	4,080,699
157 C	4,080,700
157.3 C	4,080,703
157.3 D	4,080,701
157.3 V	4,080,702
159 R	4,080,704
159.3	4,080,705
173	4,080,706
263	4,080,707
401 F	4,080,708
412	4,080,709
416	4,080,710
427	4,080,711
458	4,080,712
469.5	4,080,713
509	4,080,714
527.7	4,080,715
559	4,080,716
566.4	4,080,717
571	4,080,718
	4,080,719
577 C	4,080,720
578	4,080,721
580	4,080,722
584	4,080,723
598	4,080,724
609	4,080,725
611	4,080,726
623.4	4,080,727
	4,080,728
626	4,080,729
701	4,080,730
715	4,080,731
730	4,080,732

CLASS 30

102	4,080,733
123	4,080,734
345	4,080,735

CLASS 32

2	4,080,736
22	4,080,737

CLASS 33

18 R	4,080,738
86	4,080,739
174 L	4,080,740
	4,080,741
177	4,080,742

CLASS 34

9	4,080,743
	4,080,744

CLASS 36

50	4,080,745

CLASS 37

117.5	4,080,746

CLASS 40

613	4,080,747

CLASS 43

24	4,080,748
61	4,080,749

CLASS 44

1 R	4,081,250
	4,081,251
53	4,081,252

CLASS 46

1 R	4,080,750
	4,080,751
25	4,080,752
227	4,080,753
228	4,080,754

CLASS 47

56	4,080,755

CLASS 48

197 R	4,081,253

CLASS 49

70	4,080,756
322	4,080,757
390	4,080,758

CLASS 51

165 R	4,080,759
298 R	Re.29,592
425	4,080,760
438	4,080,761
439	4,080,762

CLASS 52

173 R	4,080,764
200	4,080,763
228	4,080,765
242	4,080,766
314	4,080,767
521	4,080,768
582	4,080,769
689	4,080,770
735	4,080,771

CLASS 53

35	4,081,096
116	4,080,772
142	4,080,773

CLASS 55

230	4,081,255

CLASS 56

199	4,080,774

CLASS 57

34 R	4,080,775
	4,080,776
140 J	4,080,777
157 S	4,080,778
160	4,080,779

CLASS 58

50 R	4,080,780
90 R	4,080,781

CLASS 59

9	4,080,782

CLASS 60

39.08	4,080,783
39.28 T	4,080,784
226 R	4,080,785
361	4,080,786
407	4,080,787
517	4,080,788
658	4,080,789
661	4,080,790
670	4,080,791

CLASS 61

35	4,080,792
37	4,080,793
45 D	4,080,794
88	4,080,795
	4,080,796
103	4,080,797
	4,080,798
108	Re.29,591
110	4,080,799

CLASS 62

4	4,081,256
51	4,080,800
238	4,080,801
514 JT	4,080,802
532	4,081,257

CLASS 63

15.4	4,080,803

CLASS 64

21	4,080,804

CLASS 65

2	4,081,258
21	4,081,259
25 A	4,081,260
65 A	4,081,261
	4,081,262
106	4,081,263
116	4,081,254

CLASS 66

57	4,080,805
64	4,080,806
115	4,080,807
125 R	4,080,808

CLASS 68

12 R	4,080,809

CLASS 70

129	4,080,810
164	4,080,811
256	4,080,812
450	4,080,813

CLASS 71

28	4,081,264
33	4,081,265
36	4,081,266
93	4,081,267

CLASS 72

32	4,080,814
42	Re.29,593
168	4,080,815
253 R	4,080,816
	4,080,817
278	4,080,818
347	4,080,819
410	4,080,820

CLASS 73

27 R	4,080,821
40.7	4,080,822
61.1 R	4,080,837
103	4,080,824
150 A	4,080,825
188	4,080,826
275	4,080,827
308	4,080,828
362 AR	4,080,829
421 A	4,080,831
421.5 R	4,080,832
423 A	4,080,833
443	4,080,834
517 B	4,080,835
597	4,080,836
612	4,080,838
617	4,080,839
655	4,080,823
719	4,080,830

CLASS 74

61	4,080,840
236	4,080,841
251 C	4,080,842
336 R	4,080,843
424.8 A	4,080,844
572	4,080,845
615	4,080,846
751	4,080,847
759	4,080,848
813 R	4,080,849
861	4,080,850

CLASS 75

52	4,081,268
60	4,081,269
	4,081,270
108	4,081,271
223	4,081,272

CLASS 81

60	4,080,851

CLASS 82

1 C	4,080,852
2 R	4,080,853
36 R	4,080,854

CLASS 83

71	4,080,855
99	4,080,856
241	4,080,857
247	4,080,858
306	4,080,859
530	4,080,860

CLASS 84

1.24	4,080,861
	4,080,862
1.27	4,080,863
312 P	4,080,864
312 R	4,080,865
383 R	4,080,866
477 R	4,080,867

CLASS 89

1.806	4,080,868
6.5	4,080,869

CLASS 91

414	4,080,870
417 R	4,080,871
436	4,080,872
446	4,080,873

CLASS 92

13.7	4,080,874
29	4,080,875
	4,080,876
61	4,080,877

CLASS 93

58 ST	4,080,878
94 R	4,080,879
	4,080,880

CLASS 96

1 PC	4,081,274
1 PS	4,081,273
3	4,081,275
35.1	4,081,276
38.2	4,081,277
48 HD	4,081,278
	4,081,279
50 A	4,081,280
64	4,081,281
77	4,081,282

CLASS 98

31	4,080,881
40 D	4,080,882
58	4,080,883

CLASS 99

433	4,080,884
501	4,080,885

CLASS 100

4	4,080,886
35	4,080,887
47	4,080,888
52	4,080,889
170	4,080,890
215	4,080,891

CLASS 101

93.04	4,080,892
124	4,080,893
128.1	4,080,894
218	4,080,895
426	4,080,896
467	4,080,897

CLASS 102

24 HC	4,080,898
42 R	4,080,899
49.7	4,080,901
67	4,080,900
70 R	4,080,902

CLASS 104

6	4,080,903
162	4,080,904

CLASS 105

367	4,080,905
489	4,080,906

CLASS 106

38.3	4,081,283
44	4,081,284
100	4,081,285
306	4,081,286
	4,081,287

CLASS 108

59	4,080,907

CLASS 109

66	4,080,908

CLASS 110

210	4,080,910
235	4,080,909

CLASS 111

36	4,080,911

CLASS 112

121.15	4,080,912
258	4,080,913
277	4,080,914
412	4,080,915

CLASS 114

65 R	4,080,916
106	4,080,917
172	4,080,918
204	4,080,919
244	4,080,920
249	4,080,921
282	4,080,922
304	4,080,923

CLASS 116

28 R	4,080,924
117 R	4,080,925

CLASS 118

5	4,080,926
48	4,080,927
59	4,080,928

CLASS 119

3	4,080,929
4	4,080,930

CLASS 122

149	4,080,931
	4,080,932
336	4,080,933

CLASS 123

25 A	4,080,936
32 G	4,080,937
32 ST	4,080,949
75 B	4,080,938
117 D	4,080,940
117 R	4,080,939
119 A	4,080,941
139 AT	4,080,942
141	4,080,943
145 A	4,080,944
195 C	4,080,945
198 DB	4,080,946
198 F	4,080,947
	4,080,948
205	4,080,934
	4,080,935

CLASS 124

1	4,080,950
92	4,080,951

CLASS 125

13 R	4,080,952

CLASS 126

263	4,080,953
270	4,080,954
271	4,080,955
	4,080,956
	4,080,957

CLASS 127

48	4,081,288

CLASS 128

1 D	4,080,958
2 H	4,080,959
2 V	4,080,960
2.06 E	4,080,961
78	4,080,962
132 D	4,080,963
142.3	4,080,964
214 D	4,080,965
214 E	4,080,966
214 F	4,080,967
292	4,080,968
335.5	4,080,969
350 R	4,080,970
383	4,080,971
402	4,081,150

CLASS 131

180	4,080,972

CLASS 133

5 R	4,080,973

CLASS 134

62	4,080,974
94	4,080,975

CLASS 135

25 R	4,080,976

CLASS 136

89 PC	4,081,289
89 TF	4,081,290
232	4,081,291

CLASS 137

56	4,080,977
79	4,080,978
118	4,080,979
218	4,080,980
	4,080,981
219	4,080,982
271	4,080,983
371	4,080,984
429	4,080,985
432	4,080,986
464	4,080,987
504	4,080,993
513.3	4,080,988
588	4,080,989
596.13	4,080,994
599.1	4,080,990

624.13 4,080,991
624.15 4,080,995
636 4,080,992

CLASS 138

30 4,080,996
37 4,080,997
107 4,080,998
125 4,080,999

CLASS 139

435 4,081,000
436 4,081,001

CLASS 140

92.2 4,081,003
123.6 4,081,002

CLASS 141

10 4,081,004
32 4,081,005
330 4,081,006

CLASS 144

3 D 4,081,007
193 A 4,081,008
309 AC 4,081,009

CLASS 145

3.1 4,081,010

CLASS 148

1.5 4,081,292
4,081,293
11.5 A 4,081,294
11.5 N 4,081,295
16 4,081,296
103 4,081,297
121 4,081,298

CLASS 149

41 4,081,299

CLASS 150

1 4,081,011

CLASS 151

14.5 4,081,012

CLASS 152

179 4,081,013
330 L 4,081,014
379.1 4,081,015

CLASS 156

71 4,081,300
164 4,081,301
190 4,081,302
192 4,081,303
204 4,081,305
212 4,081,304
250 4,081,306
4,081,309
272 4,081,307
310 4,081,308
398 4,081,310
475 4,081,311
504 4,081,312
610 4,081,313
645 4,081,314
653 4,081,315

CLASS 157

13 4,081,016
4,081,017

CLASS 160

113 4,081,018

CLASS 162

4 4,081,316
80 4,081,317
157 R 4,081,318
168 NA 4,081,319
205 4,081,320
346 4,081,321

CLASS 164

34 4,081,019
122 4,081,020
154 4,081,021

CLASS 165

11 4,081,022
53 4,081,023
62 4,081,024
140 4,081,025
170 4,081,026

CLASS 166

55 4,081,027
242 4,081,028
270 4,081,029
276 4,081,030
299 4,081,031
317 4,081,032

CLASS 172

4.5 4,081,033
22 4,081,034
484 4,081,035
804 4,081,036

CLASS 173

1 4,081,037
162 4,081,038

CLASS 174

21 C 4,081,599
68.5 4,081,600
4,081,601
103 4,081,602

CLASS 175

7 4,081,039
58 4,081,040
209 4,081,041
267 4,081,042
297 4,081,043

CLASS 176

37 4,081,322
38 4,081,323
78 4,081,324
87 4,081,325

CLASS 177

103 4,081,044
163 4,081,045

CLASS 178

19 4,081,603
30 4,081,604

CLASS 179

1 GQ 4,081,606
1 SB 4,081,607
1 SC 4,081,605
2 A 4,081,608
2.5 R 4,081,609
15 AT 4,081,610
4,081,611
15 BA 4,081,612
18 AD 4,081,614
18 FA 4,081,615
18 J 4,081,613
81 A 4,081,616
4,081,620
81 B 4,081,622
84 T 4,081,617
90 BD 4,081,623
90 CS 4,081,618
90 K 4,081,619
99 4,081,624
4,081,625
111 R 4,081,626
115.5 PV 4,081,627
121 R 4,081,628
178 4,081,629
189 R 4,081,630

CLASS 180

14 B 4,081,046
19 H 4,081,047
33 D 4,081,048
43 C 4,081,049
64 R 4,081,050
77 S 4,081,051
82 C 4,081,052
89.15 4,081,053
139 4,081,054

CLASS 182

2 4,081,055

CLASS 185

6 4,081,056

CLASS 187

1 R 4,081,057
29 R 4,081,058
4,081,059

CLASS 188

197 4,081,060

CLASS 190

52 4,081,061

CLASS 192

56 F 4,081,063
56 R 4,081,062
70.13 4,081,064
82 T 4,081,066
076 4,081,065

CLASS 195

7 4,081,326
31 F 4,081,327
62 4,081,328
63 4,081,329
66 R 4,081,330

CLASS 197

1 R 4,081,067
98 4,081,068
113 4,081,070

CLASS 198

365 4,081,071
384 4,081,069
394 4,081,072
430 4,081,073
638 4,081,074
812 4,081,075

CLASS 200

5 A 4,081,631
6 BB 4,081,632
61.27 4,081,634
67 DA 4,081,633
81.9 M 4,081,635
83 Q 4,081,621
83 WM 4,081,637
83 Y 4,081,636
84 C 4,081,639
84 R 4,081,638
144 B 4,081,640
153 G 4,081,642
4,081,643
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4,080,762	4,081,246	4,081,842	4,081,467	4,081,354	4,081,239
4,080,810	4,081,247	4,081,846	4,081,686	4,081,358	4,081,448
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4,080,835	4,081,259	4,081,858	12 : 4,080,666	4,081,360	4,081,851
4,080,836	4,081,313	8 : Re.29,599	4,080,717	4,081,365	,22 : 4,080,673
4,080,867	4,081,315	4,080,870	4,080,733	4,081,416	4,080,842
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37 : 247,609
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42 : 247,634
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44 : 247,654
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